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JAUNDICE AND THE APPLICATION OF THE VAN DEN BERGH AND UROBILINOGEN TESTS*

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JAUNDICE is one of the most easily recognized clinical signs, and, yet, at times there may be great difficulty in determining its cause. Various procedures, however, tend to simplify matters. Just as in the diagnosis of irregularities of the heart, when instrumental and other aids (electrocardiograph, polygraph, x-ray, etc.), are not available, there are a number of workable clinical rules, so it is for the determination of the type of jaundice in a given case. For example, when jaundice occurs during the first few days of life, in the absence of other signs, and passes off within a few days, it is termed "icterus neonatorum"; when in a young person the jaundice is preceded by gastro-intestinal disturbances, without undue pain or enlargement of the liver, disappearing within a few weeks, it is termed "catarrhal" jaundice; when it is accompanied by colic, intermittent fever, with little or no enlargement of the liver or gall bladder, stone in the common bile duct is usually suspected; if intense jaundice is found in a person past middle life, with no pain, but associated with loss of appetite, loss of weight and loss of strength, malignancy is suspected; if, in addition to a large liver, there are signs of portal stasis and a history of long duration, either of alcoholism or syphilis, one suspects cirrhosis.

Grouping the various causes of jaundice in order of their frequency is also helpful in diagnosis. Thus, according to Cabot, the most common causes are catarrhal jaundice, gall stones and cancer; the less common, acute yellow atrophy, syphilis and infectious diseases; and amongst the least common are hæmolytic jaundice, Weil's disease, cirrhosis and congenital abnormalities of the bile passage.

ERRORS IN THE INTERPRETATION OF CLINICAL SIGNS

Simple, however, as these rules may be, there are many exceptions to them, and I need cite only two to demonstrate the difficulties of diagnosis. Both were met with recently in the wards of the Montreal General Hospital. The first case was that of a young woman who was admitted with what at first appeared to be "catarrhal jaundice". There was no history of pregnancy, no history of exposure to drugs which have a particularly damaging effect upon the liver, and for some weeks, with the exception of the jaundice, there were no other clinical signs. Only because the jaundice failed to disappear was there any reason to suspect the original diagnosis. Then, apparently apropos of nothing, cerebral symptoms developed (headache, confusion, drowsiness, etc.), and the course became progressively worse. The patient died and the autopsy finding was "acute yellow atrophy of the liver." The other case was that of a young Chinese woman who was admitted with a history of jaundice of two weeks' duration. The jaundice was very intense. She was five months pregnant. The possibility of acute yellow atrophy of the liver associated with pregnancy had to be considered here. The course, however, was diametrically opposite to that of the first case; the jaundice gradually disappeared and the most probable diagnosis was "catarrhal jaundice".

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In ascertaining the cause of jaundice, information other than the history and clinical picture may be made use of. This includes the colour of the fæces and the condition of the urine. The interpretation of such data is, however, not always simple. It depends largely upon the appreciation of underlying physiological and pathological factors and our ideas change with the accumulation of knowledge. For example, with regard to the fæces, newer ideas of liver physiology suggest that clay-coloured stools do not necessarily indicate an obstructive form of jaundice. An analogy may be found in the case of disease of the kidneys; anuria may be due not only to mechanical obstruction of the urinary outflow (such as calculi, urethral stricture, prostatic enlargement, etc.), but also to defective function of the renal cells, that is, nephritis.

With regard to the urine, in addition to difficulties of interpreting results of tests for bile, there are technical sources of error. These difficulties are best expressed in an aphorism. I do not recall the author, but the words are "One of the best tests for bile in the urine is the finding of a subicteroid tint in the conjunctivæ."

THE RELATION OF THE LIVER TO JAUNDICE

The importance of the liver in the metabolism of the individual is suggested from its anatomical position. It is interposed between the gastro-intestinal tract and the greater circulation. Its position thus suggests a "sorting-room", and implies a purposeful division and reconstruction of the many materials absorbed from the gastro-intestinal tract. Besides its association with biliary metabolism, we know it is concerned with the metabolism of carbohydrates (for example, the storage of glycogen); fat (for example, emulsification and preparation for digestion and absorption); and protein (for example, deamination). In addition to this, it has a detoxifying function, whereby a variety of harmful substances, foreign and otherwise, which apparently can do no harm while in the gastro-intestinal tract only, are destroyed or so altered chemically as to make them inert when absorbed. The relation of the liver to blood coagulation is suggested by its association with fibrinogen formation.

Based upon our knowledge of these functions, a variety of tests have been devised for the estimation of liver efficiency; and, as with tests of renal efficiency, each has its particular application. For example, disturbances of carbohydrate metabolism occur much earlier than disturbances with respect to deaminization of proteins. For this reason, the "lævulose tolerance test" is made use of in mild disturbances of liver efficiency; whereas the determination of the amino-acid content of blood is of value in advanced lesions only. Since, however, we are at present concerned, particularly, with jaundice, the discussion will be confined to this aspect of the liver function.*

At the time of Virchow (1847), two types of jaundice were recognized, with respect to the site of origin, namely, (a) hepatic, and (b) extra-hepatic. The hepatic form was supposed to be due to obstruction of the biliary tract; extra-hepatic jaundice, as the name implies, originated in tissues other than the liver. The mechanism of extra-hepatic jaundice was not quite clear. Evidence, however, that jaundice is of hepatic origin only was presented by Minkowski and Naunyn (1886). These authors found that the jaundice produced in geese by arseniuretted hydrogen could not be produced if the liver was removed before exposure to the gas. At a later date (1908) Eppinger's work strengthened this view, and it was generally accepted that all jaundice was of hepatic origin and due essentially to obstruction. Within recent years, however, the pendulum has swung back to the idea of hepatic and extra-hepatic types of jaundice, largely due to the discovery of the reticulo-endothelial system by Ribbert (1904). This term is applied to a group of cells widely scattered throughout the body, but found chiefly in the liver, endothelial cells of the spleen, bone-marrow, lymph-nodes and lymphoid tissue generally. The relative importance of the different groups of cells is not known. Their number may be suggestive; in man, the number of Küpffer cells of the liver—a part of the reticulo-endothelial system — is small, compared with the cells in the spleen.

In 1912 McNee drew attention to the bile-forming capacity of this system, and this, with

* There is a large and steadily growing literature on this subject. The accompanying bibliography, brief as it may seem, includes all of the essential data, and fully covers the subject; it will be found not only to deal with the work adequately, but also to contain the references to other papers. Over four hundred publications have been consulted in the compilation of this shortened list.

Aschoff's work in 1922, has completely changed our ideas of bile pigment formation; not only do we now recognize an extra-hepatic origin of bile pigment, but, our ideas as to the site of bile formation in the liver itself have also changed. Thus, at one time it was thought that the bile pigments originated in the polygonal cells of the liver; now, however, this function is attributed to the Küpffer cells. To the polygonal cells is attributed only the function of transmitting to the bile capillaries the bile brought to them either from the circulation or the Küpffer cells. The evidence is not conclusive. The finding in the Küpffer cells of products of blood destruction—debris of the red blood cells, free hæmoglobin and hæmosiderin—and failure to find them in the polygonal cells is very suggestive. On the other hand, there is still some doubt that bile pigment has its origin in red blood cells only. The conclusion is based largely upon experiments with intravascular hæmolysis, effects of the injection of hæmoglobin into the circulation, studies of clinical forms of hæmolysis and upon the close chemical relationships between hæmoglobin and bile pigments. The possible origin of bile pigment from degradation products of chlorophyll ingested with vegetable matter and from muscle pigment (cytochrome) has by no means been excluded; Whipple and Hooper (1922) point to the close chemical relationship which also exists between hæmoglobin and proteins and the green colouring matter of plants.

Nor is the question settled in regard to the importance of the liver in the formation of bile pigments. The works of Whipple and (1916), Rous and McMaster (1921) and that of Mann (1921) deal with this phase of the subject in detail.

LABORATORY TESTS FOR LIVER FUNCTION

Along with experimental work has been the development of laboratory procedures for the estimation of liver function. With regard to pigmentary metabolism, two in particular will be dealt with, as they have contributed largely to the prevalent theory of the mechanism of the production of jaundice, and have formed the basis of diagnostic measures. One of these tests is the van den Bergh reaction for bilirubin in blood; the other is the quantitative estimation of urobilinogen in urine. These will now be outlined briefly.

The van den Bergh reaction.—Ehrlich (1883) first made the observation that when a diazonium salt is added to a solution of bilirubin a new compound, azo-bilirubin, is formed, the solution becomes coloured, and the colour depends upon the reaction of the solution—red when neutral, and blue when the solution is acid. The practical importance of this observation in clinical work appears to have been overlooked until Hijmans van den Bergh and Snapper (1913) applied it to clinical work. van den Bergh found the test more reliable than any of those made use of in the past, both for the detection and quantitative estimation of bilirubin. Quantitative ideas of bile pigment physiology were, therefore, made possible, and, as McNee aptly puts it, van den Bergh transfered our outlook on jaundice from the colour of the skin to quantitative changes in the blood. McNee introduced the subject to the English literature.

The reaction, as just stated, is very delicate; by it we may detect bilirubin, when in alcoholic solution, in dilutions as great as 1:1,500,000. With regard to human blood a number of facts have been elicited. Normal blood serum contains between 0.1 and 0.25 mg. of bilirubin per 100 c.c., or, in other words, this pigment is present in dilutions of 1:1,000,000 to 1:400,000. As the reaction is frequently expressed in terms of "units" of bilirubin, it may here be observed that one unit corresponds to a dilution of 1:200,000. In other words, normally, blood serum contains 0.2 to 0.5 units. It also appears that, as for sugar and a number of other blood constituents, there is a renal threshold for bilirubin; the normal threshold is about 2.0 mg. per 100 c.c. or 4 units.*

Quantitative studies have shown that sera of normal individuals may contain excess quantities of bilirubin in the absence of conditions with which jaundice is ordinarily associated. This explains, at times, as van den Bergh points out, the sallow complexion of apparently healthy individuals; the serum of such individuals may contain as much as 2 to 3 units of bilirubin per 100 c.c. In these cases there

* With the use of a new and more sensitive method for the detection of bilirubin in urine (Hunter, G., *Canad. M. Ass. J.*, 1930, **23**: 823) the writer has been able to detect this pigment when there were as little as 1.8 units of bilirubin in the blood. Bilirubin, however, still appears to be a "threshold" substance.

may be no enlargement of the spleen, the urine may contain neither bile nor excess quantities of urobilinogen, and the resistance of the red blood cells to the hæmolytic effects of weak saline solutions may be normal. Interesting as these quantitative data may be, the qualitative findings are no less so, as the use of this test in diagnosis was originally largely based upon them. They will be referred to briefly. When the reagent is applied to serum the following reactions may be observed.

TYPES OF VAN DEN BERGH REACTIONS

If a reddish violet colour reaction occurs immediately on adding the reagent to the serum and reaches a maximum within about 30 seconds, the reaction is known as *immediate direct.*

When, with the same technique, a reddish colour is observed to develop only after some time has elapsed (1 to 10 minutes) and deepens to a violet hue, the reaction is known as *delayed direct.*

When a reddish colour appears *immediately* and, only after some time deepens to a violet hue,, the reaction is known as a *biphasic direct.*

When no colour reaction whatever occurs after addition of the reagent to the blood directly, but does occur after the blood proteins have been precipitated with alcohol and the reagent has been applied to the clear alcoholic filtrate, the reaction is known as *indirect.*

Though the above reactions are those most frequently met with, there are a number of slight differences. van den Bergh sought an explanation of these differences, and it was the result of this investigation which largely formed the basis of the use of this test in clinical medicine until recent years. These will be dealt with later.

TESTS FOR UROBILINOGEN

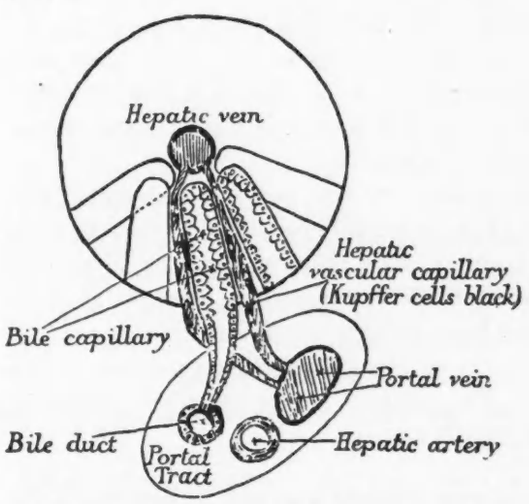
The literature on urobilinogen is old, and dates back to 1868, when Jaffe isolated from urine and bile a substance which he called urobilin. For a simple and reliable test for the detection of urobilinogen, we are, again, indebted to Ehrlich (1886). The reagent in its original form consisted of a 3 per cent paradimethylamidobenzaldehyde in a 50 per cent solution of hydrochloric acid. As with the van den Bergh reaction, however, though the reagent is due to Ehrlich, it was another worker (Neubauer, 1903) who first found that when it is added to urobilinogen solutions, a red colour reaction takes place. The test is not specific for urobilinogen, being common to a variety of chemically related substances; but, for practical purposes, as far as urine is concerned, it may be assumed to be so.

Based upon this reaction, Wallace and Diamond (1925) devised a quantitative test.* The test consists, essentially, of serial dilution of urine and the addition of a definite amount of reagent to a definite quantity of diluted urine. The reagent for this purpose consists of 2 per cent solution of the aldehyde compound in 20 per cent hydrochloric acid. The amount of pigment is judged by the greatest dilution of the urine in which the faintest pink colour is still discernible on the addition of the reagent. The test is sufficiently practical to be used in office work; the reagent keeps for some time, and serial dilution of the urine may be made with ordinary tap water. As with all other tests, there are a number of technical precautions which have to be taken. For example, exposure of urine to ordinary atmosphere and light tends towards low values, owing to the conversion of urobilinogen into urobilin. Since this test was reported, it has been in routine use in our laboratory. Many thousands of determinations have been made, and our experiences, on the whole, are quite in agreement with those described by Wallace and Diamond. Recently, by a slight modification, we have made the test more sensitive so that urobilinogen can be detected in much higher dilutions of urine. Instead of adding the reagent to the diluted urine, we add the reagent directly to the undiluted specimen, wait for maximum colour development, and then make serial dilutions of the coloured specimen with water until no pink colour is obtained. With this technique, very faint pink discolorations do not tend to be masked by the greenish yellow colour of the reagent. (The principle of this modification appears sound, as upon it is based all quantitative colorimetric work). The values with this procedure, therefore, tend to be higher than with the original technique. With very few exceptions, however, our experiences are in agreement with the conclusions

* Though there are a number of other reactions, discussion will be confined to this one only, because of its simplicity.

drawn by the authors of the original test. The findings are as follows.

Urobilinogen is a normal constituent of urine. Under normal conditions, it is uncommon to obtain a positive reaction in urine which has been diluted to a greater extent than 1:20 with water. The amounts found vary during the day, but the smallest and most constant quantities are found in the morning. As with normal persons, the amounts vary also in pathological conditions, the smallest quantities being found during the night and early morning hours. In our experience at least, when compared with the van den Bergh reaction and when properly interpreted, this is the most delicate test for the detection of impaired liver efficiency, so far as the pigmentary functions of this organ are concerned. Since the interpretation of this test, as well as of the van den Bergh reaction, depends upon ideas of bile formation and excretion, an outline of the prevalent theory regarding these will now be given. For this purpose, reference is necessary to the finer histological structure of the liver. A simple conception of this structure will be found in the accompanying diagram.



A liver lobule. According to McNee, (*Quart. J. Med.*, 1922-23, **16:** 390).

MECHANISM OF THE PRODUCTION OF JAUNDICE

Each lobule is regarded as made up of a series of tubular glands arranged in radiating form. Each tubule is shaped like a test tube and the closed ends point to the centre of the lobule. The walls of the test tubes may be looked upon as basement membranes and along the walls are situated the polygonal cells of the liver. The central, or empty, portions of the tubes represent the bile capillaries. The bile capillary thus begins at a blind end. Between these tubular glands run the vascular capillaries of the portal system, passing from the portal tract and joining the hepatic vein in the centre of the lobule. Along the walls of these capillaries lie the Küpffer cells. With this diagram in view, we may now proceed to an outline of the mechanism of bile pigment production and excretion.

Hæmoglobin, a product of disintegration of red blood cells, is brought by means of the circulation to the various cells of the reticulo-endothelial system and is there converted into bilirubin. The relative importance of the various groups of cells in this system—for example, whether the spleen is more important than the liver—is problematical. The bilirubin thus formed enters the polygonal cells and is conveyed by them to the bile capillaries. The bile then passes to the gall bladder, from the latter into the common bile duct, and thence into the gastro-intestinal tract. On reaching the colon, chemical transformation of bilirubin takes place with the aid of the *B. coli*, with the result that it is reduced to urobilinogen. The greater part of the urobilinogen is excreted with the fæces and part is reabsorbed into the portal circulation and passes to the liver. Here, part may be re-excreted, unaltered, as urobilinogen and part may be re-converted into bilirubin by the Küpffer cells. Another portion is reabsorbed into the circulation, passes through the renal artery, and is excreted in the urine. The sum total of the activity of all tissues taking part in the metabolism of urobilinogen is such that there is a very small, but fairly constant, amount found in the urine of normal individuals; with Ehrlich's reagent, as stated before, the amount found is such that when one part of urine is mixed with 19 parts of water (1:20 dilution) the red colour which develops with undiluted urine is barely visible, or not at all. In diseased conditions, to be referred to, it is possible at times to dilute the urine as much as 1:1,000 or more and still obtain the reaction.

CAUSES OF JAUNDICE

According to the above outline, assuming the theory to be correct, jaundice may be produced in four ways, as follows:

1. *Obstruction,* either in the small bile capillaries or larger ducts. Under these conditions, the bile formed either in the Küpffer cells of the liver or brought to the liver by the circulation has passed through the polygonal cells and into the bile channels, but, because of mechanical obstruction, cannot be excreted into the intestines. As back pressure increases, the bile is reabsorbed by the hepatic vascular capillaries and finally reaches the general circulation.

2. *Hepatitis,* with defective function of the polygonal cells. Here, because of disease, the cells have lost their ordinary capacity to transmit the bilirubin into the bile capillaries. The result is reabsorption of some pigment into the hepatic vein.

3. *Hæmolysis.*—Here excess blood destruction has led to excess bilirubin formation. Therefore, though the polygonal cells are normal and have a normal capacity to transmit bilirubin, more of the latter is brought to them than they can carry. The result is reabsorption into the hepatic vein. Here may be included all diseases associated with hæmolysis.

4. A mixture of types 1 and 2. Here, in addition to partial destruction of the polygonal cells, there is also some obstruction in the bile channels. Under these conditions, in addition to some bile which has been reabsorbed from the bile channels into the circulation because of obstruction, some pigment which has never reached the bile channels, because of defective carrying capacity of the polygonal cells, is also reabsorbed.

It was chiefly on the above observations that the interpretation of the van den Bergh reaction was based, and the following factors were considered as causes of different types of the van den Bergh reaction.

CAUSES OF THE DIFFERENT TYPES OF VAN DEN BERGH REACTIONS

van den Bergh (1918), working with the diazo reaction, found that some specimens of bile gave a colour reaction when treated with the reagent directly, while others required the addition of alcohol before a colour change could be observed. Extending his work to blood serum he found that a direct reaction was obtained when the reagent was added to the serum of obstructive jaundice; whereas, a delayed or negative reaction was noted, when the reagent was added to the serum of hæmolytic jaundice. Because of these and other studies with bilirubin solutions, van den Bergh suggested that there was some chemical difference between the two forms of pigment, or perhaps the pigment was modified by its attachment to the protein of the serum; the form present in the serum of obstructive jaundice was probably circulating in a free state, while that giving the indirect reaction was bound with serum protein and, in order to detect its presence, had to be liberated from the proteins. Precipitation of the protein with alcohol accomplishes this separation.

McNee (1922) originated the theory that the reaction depends entirely upon the fact whether the bilirubin has, or has not, passed through the polygonal cell of the liver. If it has passed through, it invariably gives a direct reaction. The indirect reaction, such as is found in cases of hepatitis without obstruction, was explained by an increase in the circulatory bilirubin that has not been through these cells. van den Bergh agreed with this conception. According to these views, blood from obstructive jaundice would yield an immediate direct reaction, hæmolytic jaundice would account for a delayed reaction, and jaundice due to a toxic agent and which, furthermore, may be due to a combination of obstruction and hepatitis would account for a biphasic reaction.

Since then the test has received much study, both chemically and clinically. From the chemical point of view there appears to be no doubt that the different reactions can be explained on the basis of different forms of pigment. The literature on this phase of the subject is increasing. The present status may be summarized very briefly.

CHEMISTRY OF THE VAN DEN BERGH REACTION.

A number of possibilities appear to have been excluded. Differing from the original observation van den Bergh, it has been shown that biliverdin does yield a colour reaction with the reagent (Davies and Dodds, 1927). On the other hand, biliverdin, *per se,* does not account for the different reactions (Griffiths and Kaye, 1930). Combination of pigment with protein (van den Bergh, 1918, and Blankenhorn, 1921) appears to be excluded (Andrewes, 1924). Possibilities such as linkage with a lipoid (Feigl

and Querner, 1919), a colloidal condition of the serum (Adler and Strauss, 1922), accelerating influence of cholesterol or bile acids (Thannhauser and Anderson, 1921), have also been considered. That an ammonium salt of bilirubin (Collinson and Fowweather, 1926) may explain the different reactions, appears to have been excluded (Andrewes, 1924), Davies and Dodds (1927), Roberts (1928). Hoover and Blankenhorn (1916) showed that the dialysing properties of "obstructive" bilirubin were different from the "hæmolytic" type and this was supported by the observations of Leschke (1921) and Brulé, Garban and Weismann (1922). However, according to Davies and Dodds (1927), the reactions noted can be explained on a basis other than the presence of different forms of pigment. Newman (1928) suggests that the pigment giving the prompt reaction is sodium-hydrogen-bilirubinate. From the most recent studies (Griffiths and Kaye, 1930) it would appear that indirect reacting serum alone contains bilirubin.

Further suggestive of the existence of at least two types of pigment are the different threshold values noted in clinical studies. Bilirubin is, as stated above, a threshold substance and is usually found in the urine when its concentration in the blood reaches 3.5 to 4 units. van den Bergh first observed that bile was never found in the urine in the extra-hepatic forms of jaundice, regardless of the bilirubin content of the blood. McNee reports a case of hæmolytic jaundice with 11 units of bilirubin and no trace of bile in the urine. Recently, Snider and Reinhald (1930) presented an entirely novel idea, namely, that the type of reaction depends upon the concentration of bilirubin. It may, however, be observed that, in view of the intensive physical and chemical studies just referred to, diametrically opposite conclusions can be drawn from the experimental data.

In spite, however, of the fact that there probably are different types of pigment and that the different reactions depend upon the latter, clinically, with accumulation of more data—and I now quote from our own experiences—the different reactions noted fail to yield the information attributed to them at first. The reason for this is probably the fact that, clinically, pure obstruction and pure hepatitis are uncommon. Obstruction of the biliary channels for any length of time almost invariably leads to some disturbance in the polygonal cells. There is also experimental proof of this. Ogata (1913) has shown that interference with the outflow of bile can result in hepatic necrosis. Also, hepatitis and hæmolytic processes are not infrequently associated with some obstruction in the biliary channels. As a matter of fact, in a later review of the test, McNee and Keefer (1925) point out that, as a rule, in the commonest type of jaundice, (toxic and infective hepatic group) the reaction yields little or no information of any diagnostic value. This group includes the acute fevers, chemical poisons (arsenic, phosphorus, chloroform, trinitrotoluol, atophan) pregnancy, "idiopathic" acute yellow atrophy and catarrhal jaundice. It is in this large group of cases that the biphasic type of reaction described is so frequently met with. The explanation of this reaction, as stated above, is that though some pigment fails to pass from the polygonal cells into the bile capillaries, and, therefore, gives a delayed reaction, some does pass the damaged cells but, owing to obstruction, is reabsorbed into the circulation and gives an immediate direct reaction.

From experiences to date it would appear that when used by itself the van den Bergh reaction is of value only in the detection of latent jaundice, and in doubtful icteroid tints of the skin, and its quantitative studies are of value in measuring progress in cases of definite jaundice when the colour of the skin alone may be deceptive.

Limited, however, as is the amount of information that the van den Bergh reaction by itself may yield, when it is used together with the urobilinogen reaction we have a very valuable laboratory aid, not only for diagnosis but for the estimation of progress in a large group of cases.

LIMITATIONS OF THESE TESTS

As with all other tests, however, results are met with at times which appear to be incompatible with known physiology, pathology and clinical experience. Under these conditions it is apparently the prerogative of the clinician to state that "the test is no good". Depending upon his environment, the reaction of the laboratory worker to such remarks differs. When there is very close cooperation between the

laboratory and the clinician, and when the scepticism on the part of the clinician is healthy, such remarks merely stimulate further effort. Though, under a given set of conditions, the test appears to be "no good", it is the duty of the laboratory worker, provided he is certain that there have been no technical errors, to attempt to further investigate the incompatibility and formulate other theories. With a large amount of clinical material, theories which do not fit the facts are readily excluded. This observation is particularly appropriate with regard to the combined use of the van den Bergh and urobilinogen reactions. In the correlation of the known facts of physiology and pathology with clinical experience, incompatible data are met with from time to time. In seeking for an explanation of these findings, many theories were developed and discarded. An explanation was finally suggested and, at least so far, the clinical and laboratory data fit. Incidentally, as the data fit, and as the explanation suggested is based upon the above theories, not only of the origin of bile pigment but also of the sites of its formation and excretion, such data tend to further strengthen these theories. In the final analyses it must be recognized that we are still dealing with theories. The explanation of what, at first, appeared to be incompatible data is based on the following experiences.

NEWER INTERPRETATIONS OF TESTS

Apparently the first evidence of impairment of the liver efficiency, in the absence of mechanical obstruction, is excess quantities of urobilinogen in the urine; the bilirubin content of the blood (van den Bergh reaction) is still normal. With further impairment of the liver, the van den Bergh reaction becomes positive and urobilinogen excretion increases still further. With more marked impairment, the van den Bergh reaction becomes more marked, but excretion of urobilinogen begins to diminish. With extreme liver damage, the van den Bergh reaction becomes still more marked and is accompanied by *complete absence of urobilinogen in the urine.* With recovery of the liver, the findings are reversed. Thus, the first evidence of recovery is reappearance of urobilinogen in the urine with no alteration of the intensity of the van den Bergh reaction. With further increase of urobilinogen excretion the van den Bergh reaction becomes less marked, and eventually becomes negative. Finally, urine urobilinogen excretion becomes normal.

From the above, and assuming the present theory of bile pigment formation and excretion to be correct, it would appear that the first functional derangement of the liver, with respect to bile pigment metabolism, is inability on the part of the Küpffer cells to completely reconvert the urobilinogen into bilirubin. The polygonal cells have, as yet, not lost their capacity to transmit either bilirubin or urobilinogen. This would explain the fact that, though urobilinogen excretion is increased, the bilirubin content of the blood (van den Bergh reaction) is still normal. (It may here be observed that, according to the present theory, although hæmoglobin can be converted into bilirubin by cells other than the Küpffer cells of the liver, the Küpffer cells must largely bear the burden of reconversion of urobilinogen to bilirubin.) With further impairment, the Küpffer cells of the liver have completely lost their capacity to reconvert urobilinogen into bilirubin and though the polygonal cells are still able to transmit urobilinogen, they are now unable to transmit bilirubin. This would explain a slightly positive van den Bergh reaction accompanied by a *further* increase of urobilinogen in the urine. The next stage is when the polygonal cells have not only lost their capacity to transmit bilirubin, but are losing their capacity to transmit urobilinogen. This would explain an increasing van den Bergh reaction accompanied by a decreasing urine urobilinogen, and lastly, with complete suppression of function of the polygonal cells, there is no excretion either of bilirubin or urobilinogen. This would explain a very intense van den Bergh reaction associated with *complete absence* of urobilinogen in the urine. The latter finding, in our experience, is of the gravest prognosis, but not in all types of jaundice. For example, it has an especially grave prognostic significance in the toxæmias of pregnancy, associated with jaundice, whereas with ordinary catarrhal jaundice the prognosis is not so grave.

The above theory may not appear to be compatible with anatomical findings. For example, as our pathologist, Dr. L. J. Rhea, tells me, one

frequently finds that, in spite of the fact that the polygonal cells *may practically be completely destroyed*, the Küpffer cells may still be well defined. From an anatomical point of view, therefore, it would appear that the polygonal cells are destroyed *before* the Küpffer cells. Experience with other organs, however, has taught us that anatomical integrity and functional efficiency do not necessarily parallel each other. The kidney is a striking example of this fact.

The fact that the polygonal cells of the liver may fail to transmit bile pigments offers another explanation of the "clay-coloured stools". In the past, we were generally taught that clay-coloured stools indicated an obstructive form of jaundice. From the above theory, it is obvious that there need be no obstruction, as clay-coloured stools may also be due to defective transmitting capacity on the part of the polygonal cells. Proof of this is found in cases of "acute yellow atrophy of the liver". In a number of such cases that have come to autopsy in this hospital, clay-coloured stools were found during life, and, microscopically, the livers showed no evidence of obstruction. This may also explain the clay-coloured stool noted in ordinary catarrhal jaundice. As a matter of fact, the consensus amongst pathologists at present is that in catarrhal jaundice we are not dealing with an obstructive phenomenon, but merely with a hepatitis. In other words, as stated before, conditions in the liver are somewhat analogous to those found in the kidney; anuria may not only be the result of mechanical obstruction to the urinary outflow, but also the result of defective function of the renal cell.

The following three cases are cited as examples to demonstrate the value of *repeated* tests of urobilinogen and of combining both tests, namely, the van den Bergh and urobilinogen reaction, in estimating progress. All of these patients were suffering from "toxæmia of pregnancy", associated with jaundice, and were admitted into the service of Dr. H. M. Little of the Montreal General Hospital, to whom I am greatly indebted for his cooperation.

CASE 1

(No. 4568/30). A female, aged 20, was admitted August 13, 1930, two months pregnant, with a history of vomiting of ten days' duration. On admission the essential findings were pregnancy and jaundice. The urine contained only a faint trace of albumin and acetone. The blood pressure was normal and there was no œdema. The urobilinogen content of the urine on admission corresponded to a 1 in 1,000 dilution. She was given large amounts of glucose and two days later (August 15th) the acetone had disappeared, but the urobilinogen had increased. It was now *over* 1 in 1,000 dilution. As the patient was apparently getting the full benefit of the glucose, in that the acetonuria had disappeared, and as the glucose is supposed to nourish the liver, it was reasonable to assume that in spite of glucose administration, the hepatitis was progressing. On that day, the uterus was emptied and the following were the results, as far as the urobilinogen was concerned:

Date	*Urobilinogen*
August 16th	1 in 333
August 18th	1 in 250
August 20th	1 in 100
August 24th	1 in 10

The patient made an uneventful recovery.

In the following case are recorded variations of the bilirubin content of the blood (van den Bergh reaction) and of the urobilinogen in the urine.

CASE 2

(No. 1795/30). A female, aged 19, three months pregnant, was admitted on April 3, 1930. In this case there was also a very faint trace of albumin and acetone; the blood pressure was normal and there was no œdema. The additional findings were: Blood.—Urea nitrogen 53; creatinine 2.06 mg. per 100 c.c.; van den Bergh reaction 6 units. Urine.—Urobilinogen, 1 in 400 dilution.

It is interesting to note that there was marked impairment of renal efficiency as judged by the degree of non-protein nitrogen retention.

On April 4th the urobilinogen increased to a 1 in 500 dilution. The uterus was emptied on that day. Improvement of the liver and the kidneys practically paralleled each other. Thus,

Date	*Urea nitrogen*	*Creatinine*	*van den Bergh*	*Urobilinogen*
April 5th	42	1.53	4.5	1 in 500
" 7th	15	1.15	3.1	1 in 500
" 8th	19	1.13	1.5	1 in 1000
" 9th			1.0	1 in 1000+
" 10th			0.8	1 in 1000
" 11th	18	1.36	0.8	1 in 500
" 17th	10	1.31	0.5	trace

It will be noted that, on April 8th, though the bilirubin content of the blood had decreased, the urobilinogen had increased. According to the present view, the interpretation of these findings would be that the polygonal cells had improved with respect to their carrying capacity for bilirubin; therefore, as more bilirubin was being excreted, more urobilinogen was being formed. There is no evidence here that the Küpffer cells of the liver had also recovered their capacity to re-convert urobilinogen to bilirubin.

On April 10th, with very little change in the bilirubin content of the blood compared with the previous day, we note a marked decrease in excretion of urobilinogen. This, according to the above theory, indicated improvement. Suggestive of this was the further decrease of urobilinogen on the following day (April 11). The interpretation here is that, in addition to the improvement noted on April 8th, the Küpffer cells of the liver have now recovered their function of reconverting urobilinogen to bilirubin. Six days later (April 17th) all the findings were within the normal limits. Contrast this course of events with the following case.

CASE 3

(No. 7483/30). A female, aged 31, four and one-half months pregnant, was admitted on February 10th with a history of vomiting and marked jaundice. Here, again, the only abnormal urinary findings were a trace of albumin and acetone. The blood pressure was normal and there was no œdema. On admission the laboratory findings were as follows: Blood.—Urea nitrogen 19; creatinine 2.72 mg. per 100 cc.; van der Bergh reaction, 4 units. Urine.—Urobilinogen, 1 in 500 dilution. With the above creatinine value one would expect a much higher urea. The impression, therefore, at the time was that the liver damage was quite severe, in that the liver was beginning to lose its deaminizing function (that is, converting animo-acids into urea). Further suggestive of a badly damaged liver was the relatively low urobilinogen value compared with the bilirubin content of the blood (van der Bergh reaction) in the absence of anything to suggest an obstructive form of jaundice. Previous data would have been of value here for comparative purposes. However, from past experience, it appeared that the polygonal cells were markedly destroyed. Assuming the above view to be correct, the polygonal cells were losing their capacity to transmit not only bilirubin, but also urobilinogen. Proof of this was found on the following day (Feb. 11th); the van der Bergh reaction showed 5 units of bilirubin and urobilinogen 1 in 100 dilution. In other words, the bilirubin content of the blood was increasing and the urobilinogen was decreasing. Unfortunately, as the patient developed pneumonia at this time, operation was not considered advisable. On February 13th the van den Bergh reaction showed 7 units of bilirubin and the urine contained only a trace of urobilinogen. On the following day, the van der Bergh reaction showed 8 units of bilirubin and there was no urobilinogen whatever in the urine. From these findings it appeared that there was complete suppression of liver function. (The pneumonia had probably aggravated the hepatitis). The prognosis was regarded as extremely grave, in view of the *complete* absence of urobilinogen in the urine accompanied by an *increasing* van den Bergh reaction. The following day the woman died and the anatomical data supported this view. In addition to the pneumonia, the autopsy findings were those of acute yellow atrophy of the liver. There was no microscopical evidence, whatever, of obstruction in the bile channels.

THE TEST IN RELATION TO JAUNDICE

Finally, observations may here be made with regard to catarrhal jaundice. From their experience, Wallace and Diamond conclude that "the constant presence of urobilinogen in catarrhal jaundice and its total absence in mechanical obstruction, such as is encountered in carcinoma of the head of the pancreas and of the biliary tract, forms a marked distinguishing diagnostic feature between this benign form of change and those due to malignant causes." Our experience with the test for urobilinogen agrees with all of the conclusions of these authors, except the latter. We have noted complete absence of urobilinogen from the urine and quite frequently minute traces only, and because of the clinical features and the ultimate course, no other diagnosis but "catarrhal jaundice" could be made. The above view probably explains these findings. In catarrhal jaundice, the essential feature is a hepatitis, and it appears reasonable that, with varying capacity of the polygonal cells to transmit bilirubin, the amounts of urobilinogen found in the urine will vary. A disturbing feature is that, with the laboratory findings alone, there is no line of demarcation between the relatively benign condition of catarrhal jaundice and the extremely grave condition of acute yellow atrophy of the liver. In hepatitis, in general, we look upon a decreasing urobilinogen and an increasing van den Bergh reaction as of the gravest import; catarrhal jaundice is the exception. It would appear that, though, functionally, we are dealing with the same condition, anatomically the lesion in the polygonal cells in other forms of hepatitis is different. Chemically speaking, it would appear that the reaction in catarrhal jaundice is reversible, whereas in the other forms of hepatitis, such as acute yellow atrophy, it tends to be irreversible.

The purpose of the above outline is to present in brief form a summary of our knowledge of jaundice from the point of view of bile pigment formation. That laboratory data are sometimes incompatible with clinical findings led to the combined use of the van den Bergh and urobilinogen reactions and a new method of interpreting the results. So far, at least, the theory appears to fit the clinical facts.

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METASTATIC GROWTHS IN THE URETER*

A Report of Three Cases and a Brief Review of the Literature

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PATHOLOGICAL lesions that are of rare occurrence, and that are usually diagnosed at the autopsy table or in the operating room, always stimulate considerable interest and discussion. Metastatic growths of the ureter belong to this class and lately we have encountered such a condition. The subject has inspired us to review the literature and collect other similar cases that have been met with at the Royal Victoria Hospital.

New growths of the ureter, whether primary or metastatic, are extremely rare occurrences; the former appears to be the commoner of the two. Although only 59 cases of primary growths of the ureter are reported, yet an appreciable amount of literature has been written on the subject. On the other hand, very little has been published on metastatic growths of that organ. Up to December, 1930, only 8 authentic cases could be found in the current literature.

It is of extreme importance to emphasize at the start that under the heading of metastatic growths of the ureter are included those lesions only that have been proved definitely to be the result of metastases conveyed to the ureter by lymphatics or blood vessels. Secondary growths of the ureter, due to direct extension of tumours of adjacent organs such as the uterus, bladder, kidney, etc., are not true metastases, and are not included, therefore, in this class. Moreover, in order to prove that a secondary growth is a true metastatic one, malignant cells must be demonstrated in the perivascular lymphatic spaces or blood vessels of the ureter.

There is an abundant communication between the lymphatics of the pelvic organs and the ureters. This relationship is particularly striking in the cases of lymph vessels of the bladder and ureters. Despite these facts, metastatic growths of the ureter from tumours of the uterus, bladder or prostate are very uncommon findings. On the other hand metastases from growths of these pelvic organs are frequently met with in the lungs, liver, kidneys, bones, and other organs and tissues. Why this rather specific peculiarity of the ureters exists is difficult to understand. Robinson[5] claims that the lymph-drainage of the lower portion of the ureters is downwards. That may help to explain the rarity of ureteral metastases.

The first authentic case of a metastatic growth of the ureter was reported by Giordano and Bumpus[3] in 1922. The patient had a carcinoma of the prostate which metastasized to the left ureter, left renal pelvis, lungs and left kidney. They were able to demonstrate cancer cells in the blood vessels of the lungs and kidney, and were of the opinion that the metastases to the ureter were conveyed by the blood stream. Thomas and Regnier[6] reported another case in 1924. The metastatic growth was secondary to a primary neoplasm of the bladder. Metastases were also demonstrated in the lymph glands, liver and psoas muscle.

In 1925 Carson[1] added 3 more cases to the literature. The first case was that of a man with

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a carcinoma of the bladder which metastasized to both ureters, prostate, mesenteric lymph nodes, lumbar vertebræ and liver. Patient No. 2 had an adenocarcinoma of the prostate with metastases to the right ureter, bladder, seminal vesicles, vasa, right kidney, lungs, fifth lumbar vertebra and lymph nodes. The third patient was a female who had a squamous-cell carcinoma of the cervix which metastasized to the right ureter, liver, and mesenteric lymph glands. In each of the above cases microscopic examination revealed cancer cells in the perivascular lymphatic spaces, thus proving beyond doubt that the growths in the ureters were true metastatic ones. In 1927 Carson[2] reported 2 additional cases. Patient No. 1 was a male with a carcinoma of the prostate which metastasized to the right ureter, bladder, seminal vesicles, lumbar vertebræ and mesenteric lymph nodes. The second case was also that of a carcinoma of the prostate with metastases in the right ureter, bladder, seminal vesicles, right kidney, pelvis, lungs and lymph nodes. The author was able to demonstrate very readily cancer cells in the perivascular lymphatic spaces of the affected ureters.

Rathbun,[4] in 1929, described a single case. The patient, a male, had had a radical operation for a scirrhous carcinoma of the left breast in 1924. He remained well until 1927 when he began to pass blood in the urine. He was cystoscoped and provisional diagnosis of a left renal tumour was made. A nephrectomy and partial ureterectomy was then performed. The pathological report was metastatic carcinoma of the ureter, secondary to the carcinoma of the breast. The author unfortunately did not mention in his report the manner in which the growth of the ureter occurred. The tumour undoubtedly is a true metastatic one, but whether the metastases were conveyed by the lymphatics or blood vessels is a question.

We have carefully reviewed all the cases with lesions of the ureter that have been met with in the Departments of Urology and Pathology at the Royal Victoria Hospital, Montreal. Amongst them we have been able to find 3 cases of metastatic growths, thus making a total of 11 authentic cases. We venture to state that the condition is more common than the literature leads one to suppose. Furthermore, we are of the opinion that a number of the so-called primary carcinomas of the ureter are probably true metastatic growths.

Of the 3 cases that we are reporting 1 is in a female and 2 are in males. The female was 34 years of age and the males 45 and 61 years of age, respectively. Both the male patients came to autopsy, and the diagnosis was made on the post-mortem table. The female patient is still alive. The diagnosis in her case was made at operation.

CASE 1

J. E., a coloured male, aged 45 years, was admitted to the medical service of the Royal Victoria Hospital on December 19, 1922, complaining of shortness of breath, palpitation, swelling of the legs, cough, bloody expectoration and slight nocturnal frequency.

History of present illness.—The history dated back one year, when he first noticed shortness of breath on exertion. This symptom gradually increased in severity and was soon accompanied by palpitation and swelling of the legs. Cough started six months prior to admission and was associated with expectoration which at times was blood tinged. For about one year the patient had noticed a slight nocturnal frequency of two to three times—no day frequency or any other urinary symptoms.

Personal history.—He had had gonorrhœa and syphilis in 1902: had had treatment for both conditions, and was told that he was cured.

Family history.—His wife had had one pregnancy which ended in a miscarriage at the fifth month. No other pregnancies.

Examination.—On admission the patient was dyspnœic, drowsy and looked very ill. There was definite evidence of recent loss of weight. There was puffiness of both eyes and pitting œdema of ankles and feet.

The heart was enlarged to the left and a loud apical systolic murmur was present which was transmitted to the axilla. The aortic arch seemed wider than normal to percussion. The blood pressure was 190/96. The lungs showed dullness over both bases with increased vocal fremitus, and the presence of many moist râles. The liver was enlarged and the lower edge was felt two finger-breadths below the costal margin. The epitrochlear glands on both sides were readily palpated.

The findings in the genito-urinary tract were negative, except for a small smooth but rather firm prostate.

Laboratory findings.—Urine: hazy straw, acid, 1015; albumin +; sugar 0; acetone 0; diacetic acid 0; white blood cells scattered; red blood cells scattered; amorphous urates and epithelial cells; no casts seen.

Blood count.—Red blood cells, 3,010,000; white blood cells, 14,200; hæmoglobin (Sahli), 70 per cent; neutrophiles, 82.0 per cent; eosinophiles, 3.0 per cent; basophiles, 0.5 per cent. lymphocytes, 10.0 per cent; large mononuclears, 3.5 per cent; transitionals, 1.0 per cent.

Blood chemistry.—Urea, 2.67 grams per litre; urea nitrogen, 134.0 mg. per 100 c.c.; creatinine, 2.34 mg. per 100 c.c.; uric acid, 15.3 mg. per 100 c.c.

Blood Wassermann test.—Negative.

Clinical diagnosis.—Chronic myocarditis with decompensation; chronic nephritis; aortitis.

The patient was in the hospital about forty-eight hours and then died.

Anatomical summary.—Adenocarcinoma of the prostate with metastases in the ureters, lungs, pleural, abdominal and mediastinal lymph glands; bilateral pyonephrosis; hypertrophy of the heart; arteriosclerosis; dilatation of the first part of aorta.

Prostate.—Sections show a very diffuse overgrowth of glandular loops replacing a great part of the normal prostatic tissue. The loops show a very marked increase of their lining epithelium. In a great many places large

acini are practically filled with growth. The cells are large, palely staining, with deeply staining round or oval nuclei. In parts the fibrous stroma of the prostate is infiltrated by small groups of these cells arranged in irregular nests; the larger the nests the more definitely glandular formation is seen. *Diagnosis*: adeno-carcinoma of prostate (Fig. 1).

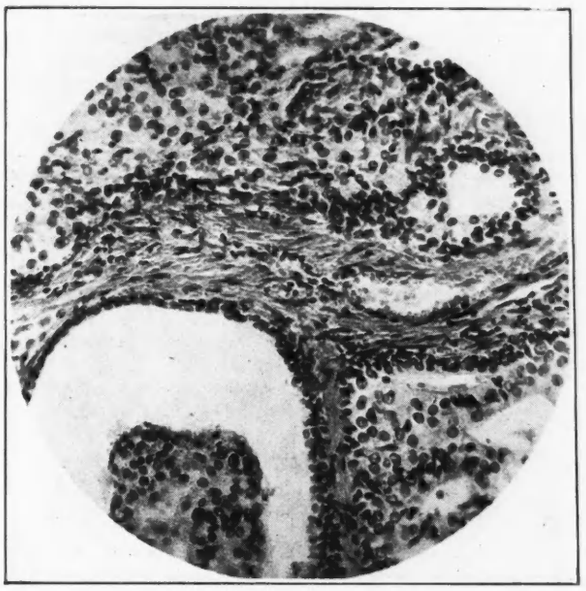

Fig. 1.—*Case 1.* Adenocarcinoma of the prostate. Acini filled with large pale staining epithelial cells which have dark staining round or oval nuclei.

Ureters.—The left was considerably dilated in the upper part and is almost obliterated in parts in the lower half. On opening the lower half the wall showed very irregular thickenings. The right ureter showed a pedunculated mass, the size of a green pea about its middle. For about two centimetres below this the ureter was free. The lumen was then blocked by a more irregular larger mass which did not appear pedunculated. This extended for two or three centimetres. *Microscopic*: the growth was firmly attached to and grew out, right and left, from the ureteral walls, which showed invasion of all their coats by the carcinomatous growth (Fig. 2). Cancer cells can easily by demonstrated in the perivascular lymphatic spaces of both ureters (Fig. 3). *Diagnosis*: metastatic adenocarcinoma of both ureters.

This case is a most interesting one. Although the patient died from a carcinoma of the prostate with multiple metastases, yet the clinical picture was that of cardiac failure and renal insufficiency. Except for the slight nocturnal frequency and a smooth firm prostate there was nothing to indicate a carcinomatous lesion of either the prostate or ureters. The partial obstruction of the lumen of each ureter resulting from the metastatic growth undoubtedly played a major part in the formation of the bilateral pyonephrosis. Cancer cells were easily demonstrated in the perivascular lymphatic spaces of the ureters, thus proving the metastatic character of the growth.

Case 2

P. R., a male, aged 61 years, was admitted to the surgical department in November, 1927, complaining of pain in the epigastrium, belching of gas, constipation and vomiting.

History of present illness.—The history dated back to February, 1927, when the patient began to be troubled with the above symptoms. The vomiting was not a constant symptom. There were no symptoms referable to the genito-urinary tract.

Personal and family history.—Irrelevant.

Examination.—The general physical examination was essentially negative.

Laboratory findings.—Urine: cloudy, straw, acid, 1015; albumin ++; sugar 0; pus ++; amorphous uretes +; epithelial cells; no casts.

Blood count.—Red blood cells, 4,600,000 per cubic mm.; white blood cells, 7,400 per cubic mm.; hæmoglobin, 70 per cent (Sahli).

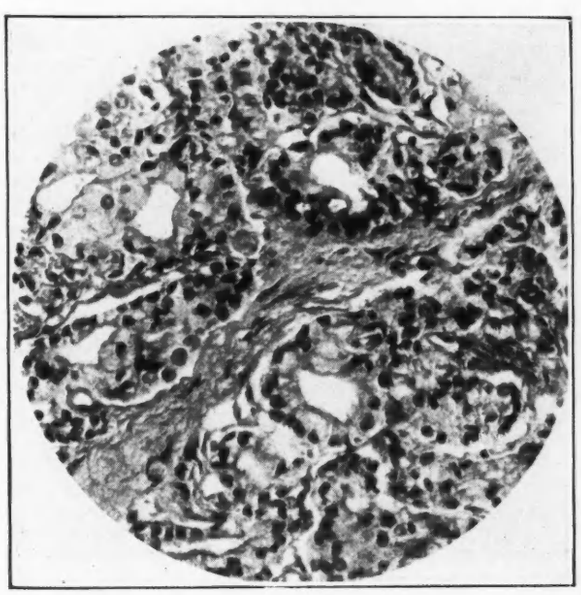

Fig. 2.—*Case 1.* High power photomicrograph of a metastatic growth of the right ureter, secondary to an adenocarcinoma of the prostate.

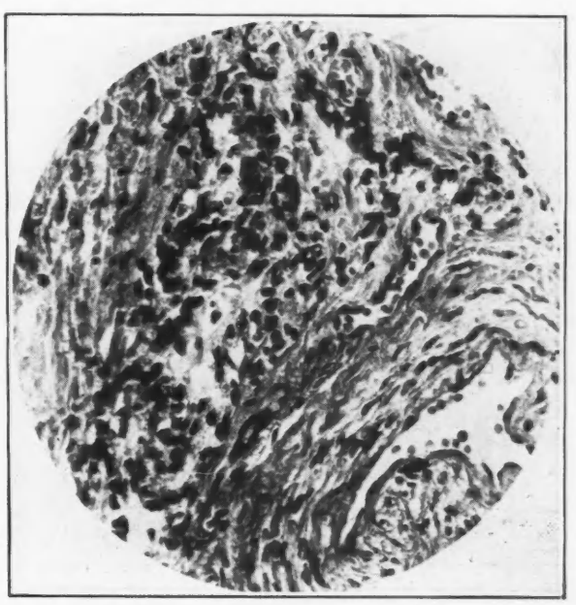

Fig. 3.—*Case 1.* Perivascular lymphatic invasion of left ureter by cancer cells, secondary to an adenocarcinoma of the prostate.

Blood Wassermann test.—Negative.

Barium series.—This revealed a lesion of the body of the stomach, probably an ulcer, but a carcinoma could not be ruled out.

A laparotomy was performed and an inoperable carcinoma of the lesser curvature of the stomach was found. As the stomach was still emptying, nothing further was done at that time. The patient was discharged on November 30, 1927. In June, 1928, he returned. He was now vomiting everything he ate. A jejunostomy was therefore performed. Patient died two months later.

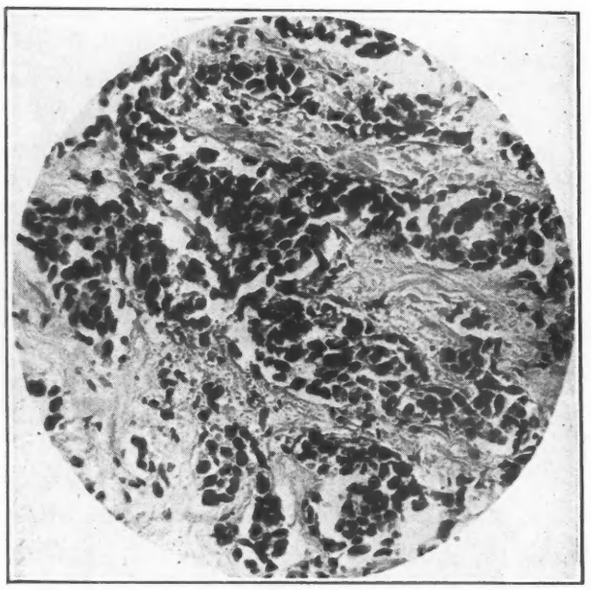

FIG. 4.—*Case 2.* Adenocarcinoma of the stomach. Note the immature glandular epithelial cells forming irregular small acini and columns. There is also present a diffuse fibroplastic stroma.

Anatomical summary.—Adenocarcinoma (scirrhous) of the stomach, with metastases in the right ureter and ileum. Also pyonephrosis, right; myocarditis; hydrothorax; fibromyoma of the prostate; and passive hyperæmia of liver and lungs.

Histology.—Stomach: Sections showed a marked thickening of the mucosa due to a diffuse proliferation of immature glandular epithelial cells. These cells formed irregular small acini and columns. There was a diffuse fibroblastic stroma proliferation, most marked in the submucosa. The muscularis appeared thickened. Small nests of cancer cells could be seen infiltrating through all the coats, and were always associated with a diffuse fibroblastic stroma, which in some areas was mature, showing extensive fibrous tissue thickening (Fig. 4).

Diagnosis. — Adenocarcinoma (scirrhous) of the stomach.

The upper half of the right ureter was moderately dilated and filled with thick purulent material. The surface was red and finely granular. There were no definite masses in the lumen. Microscopically the muscular coats were infiltrated with small nests of immature glandular epithelial cells, similar to those found in the stomach. The mucosa was intact. Fibrous stroma was abundant (Fig. 5). Cancer cells also invaded the perivascular lymphatic spaces (Fig. 6).

Diagnosis.—Metastatic adenocarcinoma scirrhous of the right ureter.

Although this patient had a definite metastatic growth of the ureter, yet there were no subjective symptoms referable to the genito-urinary tract. The urine did show a great deal of pus, which was explained by the right pyonephrosis. Here too the growth in the ureter was undoubtedly the cause of the destroyed right kidney. The finding of cancer cells in the perivascular lymph spaces definitely proved that the growth was a true metastatic one.

CASE 3

N. B., a female, aged 34 years, was admitted to the gynæcological service of the Royal Victoria Hospital on August 26, 1929, complaining of pain in the left side of

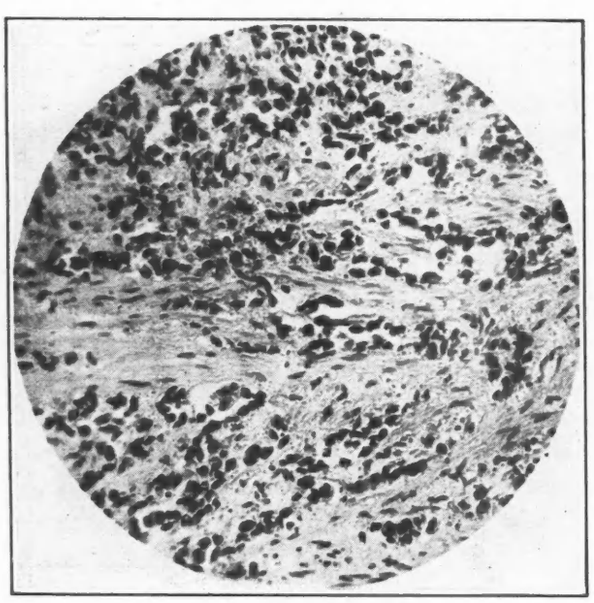

FIG. 5.—*Case 2.* Metastatic growth of right ureter secondary to an adenocarcinoma of the stomach. The nests of immature glandular epithelial cells are similar to those found in the growth of the stomach.

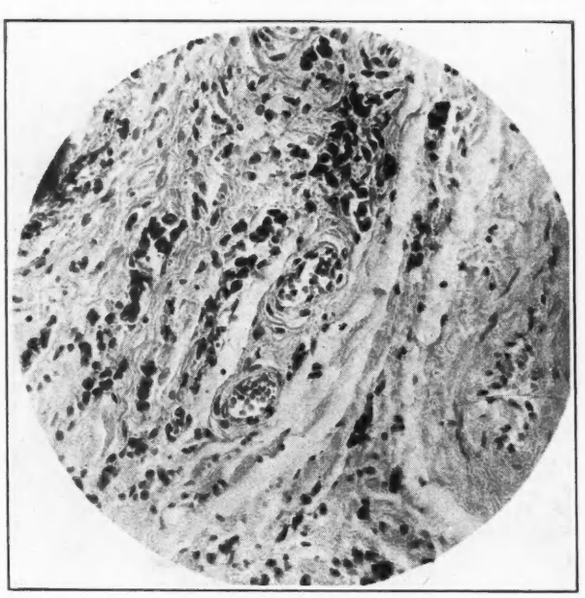

FIG. 6.—*Case 2.* Definite perivascular lymphatic invasion by the cancer cells in a metastatic growth of the right ureter secondary to an adenocarcinoma of the stomach.

the abdomen, brownish vaginal discharge, and bleeding at times.

History of the present illness.—The above symptoms first began in July, 1929, and gradually became more marked.

Personal history.—Married, with three normal pregnancies.

Family history.—Negative.

Examination.—The general physical examination was negative, except for a lesion found in the anterior lip of the cervix. A portion of this was removed for pathological examination.

Histological examination.—Sections showed muscle and connective tissue, with an overlying epithelium. The greater part of this tissue was replaced by a dense round-cell infiltration in which are nests of embryonic epithelial cells. Numerous mitotic figures were seen. Many eosinophiles were also present. The picture was that of a diffuse infiltrating squamous carcinoma of low maturity (Fig. 7).

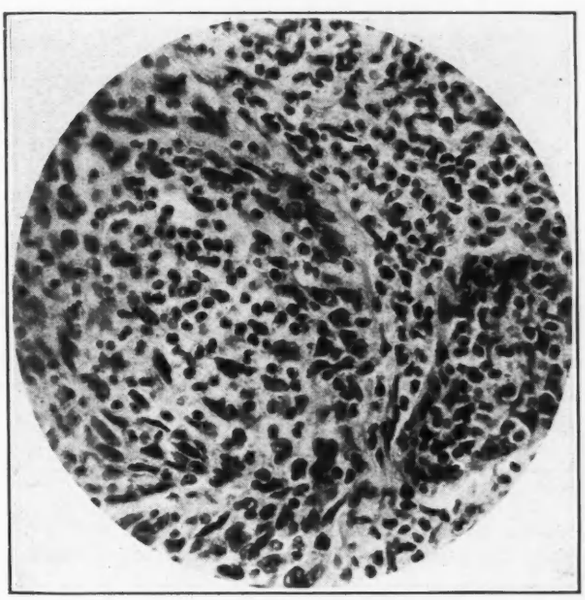

Fig. 7.—*Case 3.* Carcinoma of the cervix. Note the dense round-cell infiltration in which are nests of immature epithelial cells. Many eosinophiles could be seen in the original preparation.

The patient was given a course of radium and was kept under observation. The last pelvic examination, in September, 1930, did not reveal any recurrence of the growth. On September 3, 1930, she was admitted to the urological service of the hospital complaining of frequency of urination, pain in the left loin radiating downwards and forwards to the left lower quadrant of the abdomen, anorexia and loss of weight.

History of illness.—The history dated back to May, 1930, when she first began to have a dull ache in the left loin. In July she began to be troubled with acute attacks of pain, and also with frequency and urgency of urination. She never noticed any gross hæmaturia.

Examination.—The general physical examination revealed tenderness and resistance in the left flank and in the left lower quadrant of the abdomen. There was also considerable tenderness in the left loin. No masses or enlarged glands were palpated.

Laboratory findings.—Urine: cloudy straw, acid, 1008; albumin +; sugar none; pus +; red blood cells +; epithelial cells; no casts. One cubic centimetre of phenolsulphonphthalein given intramuscularly: excretion, 1st hour 60 per cent, 2nd hour 20 per cent, total 80 per cent.

Blood chemistry.—Non-protein nitrogen, 21.3 milligrams per 100 c.c.; creatinine, 1.39 milligrams per 100 c.c.

Blood count.—Red blood cells, 3,950,000 per cubic millimetre; white blood cells, 6,250 per cubic millimetre; hæmoglobin (Sahli), 60 per cent.

Blood Wassermann test.—Negative.

X-rays did not reveal any metastases in the lungs or bones.

Cystoscopy.—This examination revealed a definite obstruction at the junction of the middle and upper third of the left ureter. A uretero-pyelogram on the left side showed a definite constriction about the middle of the ureter. There was also evidence of a dilated upper ureter with destruction of the corresponding kidney.

Diagnosis.—A diagnosis of an obstructed ureter with a destroyed and infected left hydronephrosis was made.

Treatment.—Patient was operated upon and a nephrectomy and partial left ureterectomy was performed. At operation the kidney was very adherent and there were found a double pelvis and branched ureter for the upper third. Where the two ureters joined was a hard mass the size of a large grape. This was markedly adherent to the spine. It was removed together with the kidney and double ureter.

Pathological report.—The gross specimen consisted of a pale kidney measuring 12 by 6 cm. Two ureters emerged from the pelvis and joined, after running separately for 7 cm. At the point of junction the walls

Fig. 8.—*Case 3.* Metastatic growth at the point of junction of the two ureters. The growth was secondary to a carcinoma of the cervix.

were greatly thickened by a diffuse circular growth (Fig. 8).

Histology.—Sections from the nodule at the junction of the ureters showed the ureters to be embedded in fibrous scar tissue which was the seat of a malignant growth of immature epithelial cells, lying in small clusters in the lymphatics and perivascular lymphatic spaces. There was considerable exudative inflammatory reaction with many eosinophiles. The lining epithelium of the ureters was for the most part well preserved, and there was no evidence that the growth has originated from this source. The cancer cells grew in solid fashion without keratinization (Figs. 9 and 10).

Anatomical diagnosis.—Carcinoma solidum (metastatic from carcinoma of the cervix).

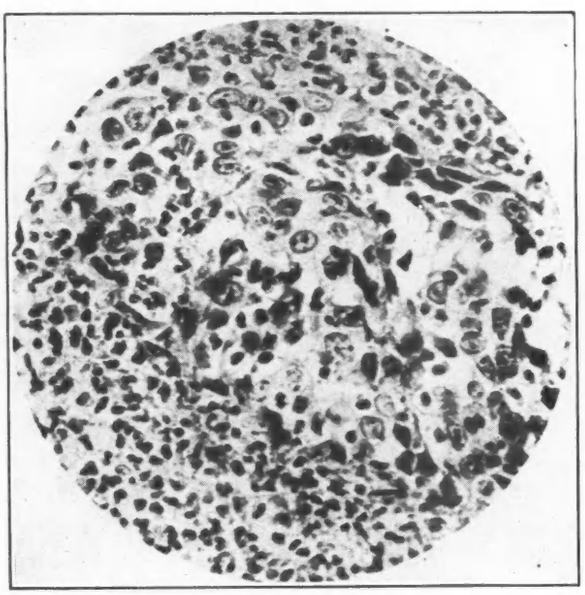

FIG. 9.—*Case 3.* Metastatic growth of the left ureter secondary to a growth in the cervix. Note the immature epithelial cells lying in small clusters. There is also considerable exudative inflammatory reaction with many eosinophiles.

DISCUSSION

The diagnosis of a new growth of the ureter, whether primary or metastatic, is made almost always at operation or on the autopsy table. There are no symptoms or signs that are pathognomonic, and the condition is only rarely considered. The outstanding symptom is pain. This may be represented by a dull steady ache on one or other side, or may simulate a severe renal or ureteral colic. Hæmaturia is a variable symptom. In primary growths it occurs at one time or another during the course of the disease, and may be profuse or very scanty. In metastatic growths, on the other hand, hæmaturia will not occur unless the growth has encroached upon the lumen of the ureter. Frequency, urgency of urination and dysuria are occasionally complained of, and usually result from a secondary infected hydronephrosis and hydro-ureter.

Cystoscopic examination gives us the most information. Ureteral catheterization usually reveals a stricture at the site of the growth, and a ureterogram demonstrates the narrowed portion of the ureter and the dilatation just above it. This patient (No. 3) had all the symptoms and signs just described. In addition she had a history of a carcinoma of the cervix. In spite of these aids a diagnosis of a growth in the ureter was not made. We must confess that we

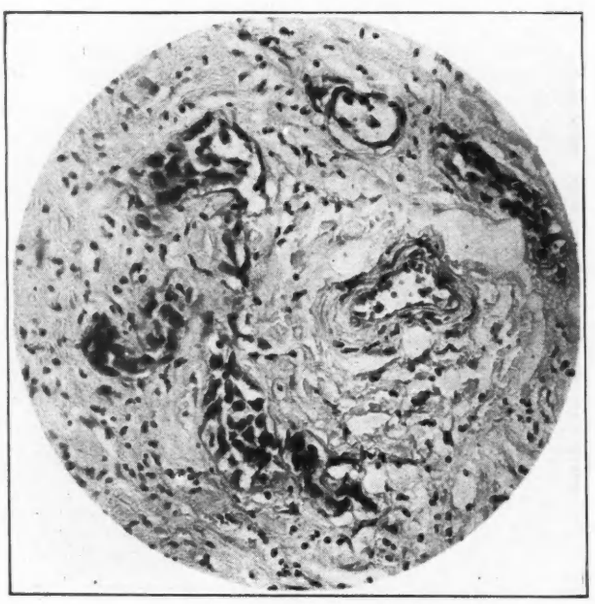

FIG. 10.—*Case 3.* Definite perivascular lymphatic invasion by cancer cells in a metastatic growth of the left ureter secondary to a carcinoma of the cervix.

considered the stricture of the ureter as due to the radium therapy.

CONCLUSIONS

1. True metastatic growths of the ureters are extremely rare.

2. We must not confuse metastatic growths of the ureter with those resulting from direct extension of tumours of adjacent organs.

3. In metastatic growths of the ureters malignant cells can always be demonstrated in the perivascular lymphatic spaces or in the blood vessels about the ureter.

4. A diagnosis of a new growth of the ureter, whether primary or metastatic, is almost always made at operation or in the post-mortem room.

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A METHOD OF PALLIATIVE TREATMENT OF CARCINOMA OF THE ŒSOPHAGUS

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CARCINOMA of the thoracic œsophagus has baffled all attempts at cure, except in a very small number of cases. Treatment by operation has yielded a cure in only three cases reported by Torek,[1] Bircher[2] and Voelcker;[10] other cases successfully operated upon are reported by Kuettner,[3] Lilienthal,[4] Eggers,[5] Kuemmell,[6] Zaaijer,[7] and Hedblom.[8] Radium and x-ray have been ineffective, partly because of the inaccessibility, and partly because of the common type of growth which is resistant to radiation. Quite massive growths, indicating a fairly late condition, exist in the œsophagus without causing marked symptoms. Again, patients with obstruction to swallowing usually carry on with any form of food that will go through. Only when fluids cause difficulty do they seek relief.

All these conditions compose a picture of late malignant disease in an organ that is almost inaccessible, the treatment of which has vexed the medical profession for centuries. Gastrostomy or enterostomy to prevent starvation has been the method of choice in the past, but some have used various methods of intermittent dilatation. The former does not relieve obstruction to swallowing and consequently does not relieve the distress and periodic regurgitation of foul-smelling mucus which is so distressing; the latter requires repetition at rather short intervals, from ten days to three or four weeks, and following each period of relief that distressing series of symptoms leading to obstruction again manifests itself. The anxiety of these patients, which is so apparent in their facial expression during this stage, must have impressed everyone.

Consideration of these facts led to the development of a method of palliative treatment, the principles of which Simmonds, and, later, Souttar, were the first exponents. The aim is to dilate the stricture and pass through its lumen a tube which will prevent closure by spasm or growth. This allows any sort of food in the diet, provided it is first minced, so sustaining the strength of the patient; and it also eliminates the symptoms of obstruction and regurgitation of mucus and precludes the method of feeding by gastrostomy which prevents the patients following most occupations and shuts them out from society generally. These benefits give the patients a different attitude toward life and relief from apprehension for the future.

The Cameron lighting system is used, and to this is fitted tubes of varying length and diameter, and oval in shape on transverse section. The distal ends of the tubes are cut transversely and without the usual beak found on œsophageal instruments. This allows of complete exposure of the upper surface of the growth even though it is slightly more difficult to introduce, but no difficulty has been met with in this respect. The proximal lighting system allows of effective illumination in all stages of all movements and is probably an advantage.

A bougie guide as illustrated (Fig. 1) is made of the 3½ inch tip of a No. 8 French urethral gum elastic bougie, the handle of which is cylindrical throughout, allowing the series of dilators ranging from 4 to 13 mm. to be passed over it. The bougie has invariably passed obstructions, including several in which a silk thread had been tried without success.

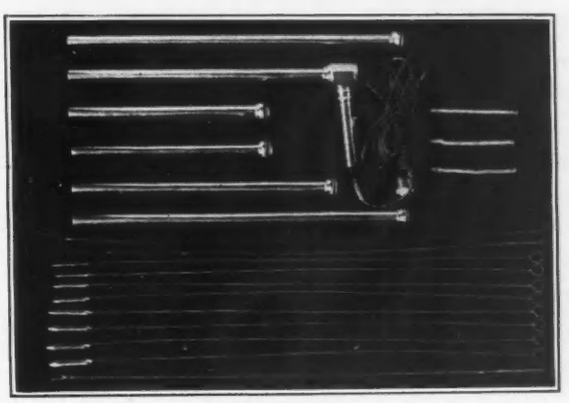

FIG. 1

The handle of the bougie then lying in the lumen of the growth guides the dilators, passed in order of size, safely through. There probably is danger of splitting the growth so that infection of the mediastinum might occur but in the cases treated so far, this misfortune has not occurred, as the absence of fever and subsequent course have shown. A special forceps as shown (Fig. 1) has teeth on both surfaces of the jaws, and serves as a swab forceps and later in the proceeding it grasps the tube to be inserted.

Tubes.—The tubes are of coil spring wire, an alloy of silver and nickel. German silver is too soft and will not resume its shape after very little distortion is produced. The fine calibre of wire makes a very soft tube which, though bent to almost a right angle on the œsophagus in a crooked stricture and both ends lying on normal mucosa, does not produce ulceration, as found at autopsy. Also the metal tarnishes, but does not corrode, even after ten months *in situ.*

In the cases treated no difficulty was found in placing the tube as desired. In none was hæmorrhage or infection produced at the operation. In one case the tube slipped through and signs of œsophageal obstruction recurred. The tube was followed by x-ray examinations in its successful course through the gastrointestinal tract without producing symptoms and another tube was later placed in the stricture which remained in position and functioned well.

Contraindications.—Those cases which from constitutional disease are unfit to have ether anæsthesia are unsuitable. Very marked cachexia, dehydration and starvation require preoperative treatment in the form of intravenous or interstitial salines and glucose in large quantities to restore normal metabolism. Local conditions such as aneurism of the aorta and tracheœsophageal fistula make the operation dangerous in the former and useless in the latter. Osteoarthritis, or other disease of the cervical spine or the occipito-atlantoid joint, or other contractures of the cervical region preventing free extension of the head, may make the operation impossible. Most of the cases reported had lost their upper incisor teeth which is an aid in manipulation.

Indications.—Growths about the level of the bifurcation of the trachea which comprise about 60 per cent of all œsophageal carcinomas are practically all suitable. They usually are of the squamous-cell type, which surround the whole circumference of the œsophagus, are fairly firm and not very vascular, all of which are the conditions most suitable for the introduction and retention of the tube. In the lower third of the œsophagus, comprising about 30 per cent, the growths tend to be more vascular and softer in consistency, with a greater tendency for the tubes to drop through. Again those at the cardiac end are of a similar type, but here one added objection is that the stomach contents regurgitate through the patent cardiac orifice, requiring these patients to be nursed in Fowler's position and subsequently their beds should have the heads elevated to prevent regurgitation into the pharynx and mouth. Hypopharyngeal and post-cricoid growths are unsuitable.

Under intratracheal or intranasal ether anæsthesia, in the dorsal position, the head and neck are allowed to project beyond the end of the operating table, and are supported by an assistant. The œsophagoscope is passed to the upper surface of the growth, when the bougie guide is passed and the extent of the growth is estimated by feeling the lower end with the shoulder of the bougie. The wire tube to be inserted should be about three-quarters of an inch longer than the stricture. Dilators are passed in order until the largest is reached, when it is left in the lumen of the growth for a few minutes to obtain further dilatation. At this stage it has been possible in all cases to remove a piece of tissue from the margin of the mass for microscopic examination. The dilator is removed and the wire spring is then introduced over the bougie still lying in the lumen of the growth.

Post-operative care.—As soon as the patient is awake sips of sterile water are allowed and when the nausea from the anæsthesia has passed large quantities of sterile glucose in water are urged in half tumblerfuls frequently. The following day clear broths, boiled milk, tea, coffee, cocoa, etc., are given in large quantities, and if there is no rise of temperature on the second night, jellies, junket, custard, egg-nog, etc., are added the following day. From then on the patient is allowed every sort of food, providing it is put through a food chopper and taken with plenty of fluids, always ending the meal with a

glass of water. He is allowed out of bed when strength has been restored.

CASE 1

No. 199823. Aged 61. There was no previous history of corrosives being swallowed. There were symptoms of difficulty in swallowing solids for four months, then difficulty with semisolids and finally with fluids. The last few days only a glass of milk per day was swallowed and there was regurgitation of a large quantity of mucus. Coincident with this was a rapid loss in weight.

Physical examination showed signs of loss of weight, with a secondary anæmia. There were no masses felt in the abdomen or cervical region, the voice was unchanged, and the chest was clear. X-ray examination showed obstruction with a tortuous lumen, characteristic of carcinoma of the œsophagus, at the level of the bifurcation of the trachea.

Under general anæsthesia dilatation to the largest size was obtained and a tube inserted. This patient lived about five months, taking food with comfort. He died suddenly of a profuse hæmorrhage.

CASE 2

No. 224101. Aged 58. There were symptoms of increasing œsophageal obstruction for eight months, with a profuse discharge of mucus which was vomited at intervals. After attempts at taking food there was a

FIG. 2

sense of heaviness beneath the sternum which increased to a dull aching pain when forced swallowing was attempted. There was a mild secondary anæmia and increasing weakness. Examination revealed no signs of metastasis. The x-ray showed the typical malignant ulceration of the œsophagus with obstruction.

Under general ether anæsthesia, the œsophagoscope was passed to the upper surface of the growth situated at the level of the bifurcation of the trachea. A large quantity of mucus and food materials was removed with a sucker, exposing the irregular hypertrophic upper surface of the growth producing the stricture. The bougie guide was passed through its tortuous lumen without difficulty and was followed by the dilators in order, until the largest was passed. The hæmorrhage produced by this procedure was so small in amount that a few small gauze wipes served to keep the field clear. After removal of a piece of tissue for microscopic section, which proved to be a squamous-cell carcinoma, the tube was inserted without difficulty. Fig. 2 shows barium passing through and entering the stomach without obstruction. There were no post-operative complications.

From the history and the length of the stricture found at operation this was unquestionably a fairly advanced condition. The patient lived in comfort for five months, when he died of bronchopneumonia.

CASE 3

No. 223201. Canadian, male, aged 58. The symptoms were of four months' duration with increasing difficulty in swallowing, beginning with solids, then semisolids, then fluids, but no complete obstruction to fluids. There was a slight loss of weight. X-ray showed a typical irregular stricture about 1½ inches in length. Pathological section showed squamous-cell carcinoma. Under general anæsthetic intubation was carried out without difficulty when an ulcerated stricture was located at the bifurcation of the trachea. There was no fever or other sign of infection following the operation. Barium was seen to pass through the tube. Six weeks later an acute obstruction suddenly developed during a meal. X-ray showed the tube in place but barium was obstructed about ¾ inch above the upper limit of the tube. After twenty-four hours, with a solution of weak acid pepsin taken every two hours, the obstruction was suddenly relieved. Now, nine months after operation the patient is carrying on at his usual occupation, taking minced food and not losing weight.

CASE 4

No. 201670. Female, Russian, aged 58. There was increasing difficulty with swallowing for two years, first with solids, then semisolids, then fluids. The first attack of complete obstruction was fifteen months after first symptoms appeared. It was diagnosed in several clinics as benign stricture of lower end of the œsophagus, but there was no history of injury or caustics to support

FIG. 3

this. Several attempts at dilatation gave only a few days relief after each operation.

Under intratracheal ether the œsophagoscope was passed, when a stricture was found in the lower end of the œsophagus, just above the diaphragm. It was a hypertrophic vascular mass completely surrounding the lumen. A piece removed for quick section showed it to be a squamous-cell carcinoma. Dilatation was carried out, when a large ulcerated cavity was discovered below the stricture. Beyond this cavity another stricture was found which was also dilated but with more difficulty. A tube 4½ inches in length was passed in the hope that it would reach beyond the distal stricture, and barium was found to pass through. Relief was obtained for about three weeks when mild obstructive symptoms again appeared. Again under anæsthetic, exploration showed the distal stricture partly closed beyond the end of the tube. This stricture was dilated and a smaller tube passed through the original one still in position.

Relief was obtained for about two and a half months when obstructive symptoms again appeared suddenly. X-ray (Fig. 3) showed the tube in position but barium passed very slowly into the stomach. Because of the double stricture and its position at the lower end of the œsophagus, a gastrostomy was done. Death occurred from bronchopneumonia about five months later.

CASE 5

No. 203526. Aged 51, Irish. There was a history of difficulty in swallowing for three months with substernal distress after swallowing too quickly. There was also a loss of 20 lbs. in weight during this period. X-ray showed a typical stricture. Examination revealed a firm stricture at the level of the bifurcation of the trachea. Dilatation was carried out when a piece was removed for section and proved to be epidermoid carcinoma and a tube was inserted. Following operation the temperature did not rise, and there was comfort in swallowing fluids, semisolids and minced solids. Patient returned to work as a labourer gaining 20 lbs. in weight in two weeks.

Four months later obstructive symptoms again gradually appeared. X-ray showed the tube missing and a typical malignant stricture again present. The tube was found lying transversely in the stomach, and was followed in its course through the gastrointestinal tract until it was eliminated without symptoms. Again under anæsthesia, dilatation was carried out and a tube placed through the stricture, following which there was no difficulty in swallowing prepared food. The patient continued at work for three months, again gaining weight and in good health. At this time he began to have respiratory distress with obstruction to inspiration and expiration, and within four days developed bronchopneumonia and died. Post-mortem showed invasion of the posterior wall of the trachea by the growth causing the obstruction. The tube was in place through the lumen of the growth. The secondaries did not extend beyond the immediate lymph drainage, and no secondaries were found in the abdomen, cervical glands or distal organs.

CASE 6

No. 216543. Aged 58, Italian. For five months there was difficulty in swallowing solids, then semisolids, then fluids with a loss of 12 lbs. in weight. X-ray showed a typical malignant stricture which examined through the œsophagoscope was found about the level of the bifurcation of the trachea, and showed some fungating masses on the proximal surface. One of these was removed for section and proved to be a squamous-cell carcinoma. Dilatation and intubation were carried out without difficulty. The patient did not develop an elevation of temperature and could swallow food as prepared. He returned to work as a labourer, gained weight and was completely free from symptoms for seven months when he died of bronchopneumonia.

CASE 7

No. 230826. Aged 67, Canadian. There was difficulty in swallowing solids, semisolids and fluids for four months, with no loss of weight. X-ray showed malignant stricture 2 inches above the cardiac orifice. Œsophagoscopy showed a hypertrophic mass in the lower œsophagus which was quite vascular, a piece of which was removed for section and shown to be epidermoid carcinoma. Dilatation and intubation were carried out with relief of symptoms for four months when the patient died suddenly of hæmorrhage.

CASE 8

No. 226499. Aged 56, male, Canadian. There was difficulty in swallowing solids, semisolids and then fluids for seven months, with loss of 15 lbs. in weight over that period. X-ray showed a malignant stricture just at the bifurcation of the trachea. Œsophagoscopy showed a stricture at the level of the bifurcation of the trachea which was fairly smooth on its upper surface. Dilatation was carried out and a piece removed for section which showed epidermoid carcinoma. A tube was passed through, no rise in temperature occurred and symptoms were relieved. The patient returned to work as a labourer, and now after six months he is still free from symptoms and has gained 12 lbs. in weight.

CASE 9

No. 225373. Aged 62, English. There was difficulty in swallowing first solids, then semisolids then fluids for two months, with weakness and loss of 10 lbs. in weight over this period. Distress beneath the lower sternum on swallowing was a prominent feature in this case. X-ray showed a malignant stricture in the lower œsophagus. On dilatation a piece was removed for section and showed epidermoid carcinoma. Intubation was carried out without difficulty, after which the temperature was not elevated and there was complete relief of symptoms. The patient returned to work as a labourer and gained 18 lbs. in weight. He is still at work seven months after the operation.

CASE 10

No. 216818. The symptoms began with difficulty in swallowing solid food, accompanied by a sense of fullness beneath the manubrium sterni. Within three months solids could not be swallowed and fluids passed with difficulty. At this time there was frequent vomiting of fairly large quantities of mucus and undigested food. Examination showed no enlargement of cervical glands, and no signs of metastasis in the abdomen. X-ray showed a typical malignant stricture at the level of the fourth dorsal vertebra. The œsophagoscope was passed to the upper surface of the stricture, when dilatation was easily carried out and a piece removed for section, after which a tube was inserted. The pathological report was squamous-cell carcinoma. The symptoms were relieved for five months with an increase of 18 lbs. in weight. At this time symptoms again appeared and on x-ray examination the tube was missing from the œsophagus. Another tube was inserted and (Fig. 4) shows barium passing through into the stomach. The patient continued at work for five months when hoarseness and a troublesome cough developed. Shortly after this a fatal hæmorrhage ended the picture.

Post-mortem examination showed invasion of the left pulmonary artery (Fig. 5) which caused the hæmorrhage.

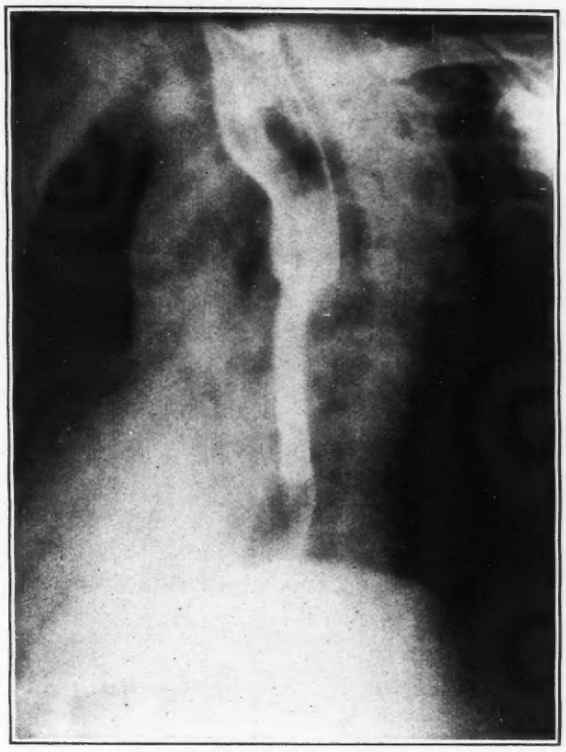

FIG. 4

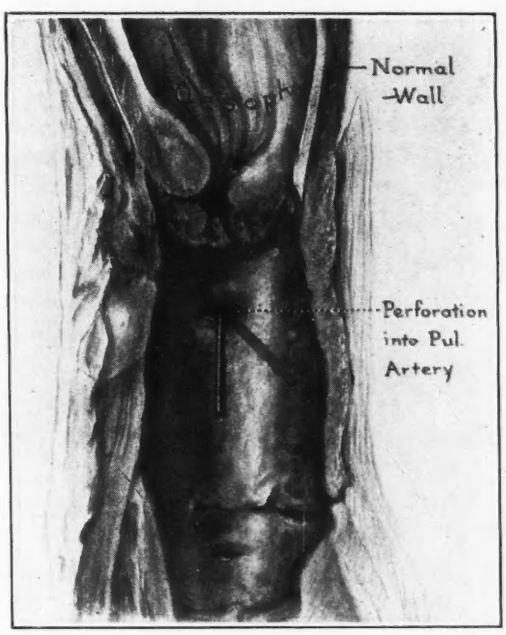

FIG. 5

SUMMARY

Intubation of carcinoma of the œsophagus, especially in its middle third, is a palliative measure that can be carried out with little danger. It provides relief from symptoms, *i.e.*, obstruction to swallowing and mucus in the throat, for periods up to ten months in this series of cases. The individual is able to take any sort of food naturally and enjoy society generally. With one exception the patients of this group were able to return to their former occupations for periods varying from three to ten months.

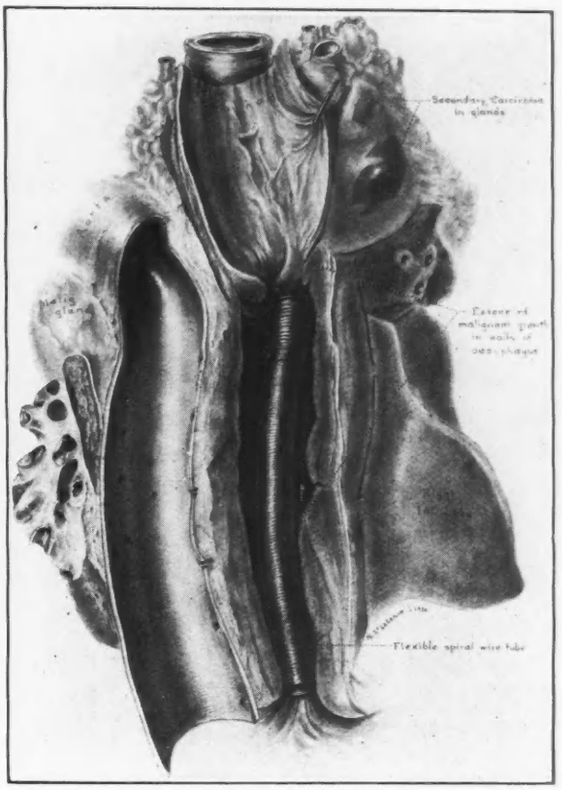

FIG. 6

In Fig. 6 the tube is shown *in situ* in the carcinomatous ulceration in the œsophagus. There were no metastases in the cervical region nor in the abdomen.

I am pleased to acknowledge the assistance of Dr. R. Graham and Dr. H. Wookey in providing some of these cases, of Miss Wishart for the drawings and of Mr. Post in arranging the x-ray photographs.

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INDICATIONS FOR CHOLECYSTIC SURGERY*

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THE selection of this subject for presentation before you is an assumption that some advancement has been made in recent years in our understanding of cholecystic disease. I shall endeavour to attempt an adjudication of the various methods of diagnosing cholecystic disease at our disposal, and to estimate their clinical value.

It is useless to argue that, because physiologists are still at variance in their opinions regarding the function of the gall bladder, we should treat this organ when diseased with extreme conservatism. When any dispensable organ ceases to function on account of disease it may become a menace, and its retention may result in serious sequelæ in organs remote from the original focus of disease. The results of gall bladder surgery are so satisfactory that we may justly claim that the rules governing the surgery of the appendix to-day should be our rules governing the diseased gall bladder. In other words, once the gall bladder is proved to be diseased it should be removed. There are things, after all, that are so obvious that we accept them without statistical proof, but in cholecystic disease we have the advantages of having certain things which are perfectly obvious and which can also be backed up by statistical proof.

The patient with cholecystic disease is mostly a chronic sufferer, and we have the advantage of time on our side in making a diagnosis. There is no particular hurry except in the acute suppurative cases, and every possible method of examination necessary to make an exact diagnosis can be utilized. I will now proceed with an analysis of the various methods used in diagnosing cholecystic disease.

HISTORY TAKING

Patients come to us because of symptoms, and it is worth while taking considerable time in analysing these symptoms and estimating their true significance. Often in gall bladder disease the history is sufficient to make a diagnosis without laboratory tests, and will almost always attract our attention to this organ when not sufficient to convict it of harbouring disease. In acute suppurative cholecystitis, the rapid onset with fever and chills, pain in the right upper quadrant, marked tenderness and rigidity, make the diagnosis clear, and I believe the indications for surgical intervention are just as clear. The usual complaints in chronic cases are either recurring attacks of acute abdominal pain or persistent reflex flatulent dyspepsia. The patient has a feeling of fullness and discomfort in the right upper abdominal quadrant, or may have pain in this area referred to the right scapular region. Vomiting or nausea may be present without any relation to the taking of food. There will likely be a history of previous attacks of colic or stabbing pain referred to the back and right shoulder. A record of previous attacks of jaundice or bilious attacks is of the utmost importance. A history of slight jaundice is usually indicative of blocking of the cystic duct, but a history of deep jaundice means blocking of the common duct. In acute exacerbations of chronic disease there will be severe abdominal pain in the right hypochondrium referred to the back or to the right shoulder, with nausea or vomiting and perhaps a chill. Few patients will give all the classical symptoms of a "text-book picture", but all will have sufficient symptoms to attract our attention to the gall bladder.

PHYSICAL EXAMINATION

The physical examination of the patient may reveal little, or much. The classical type of patient — middle-aged, fat and multiparous — seldom holds good. The patient may be fat or thin, male or female, old or young. Local tenderness may be elicited by firm pressure under the costal margin. During an attack of colic the tenderness is more marked. Often a palpable

* Read on June 24, 1931, at the sixty-second annual meeting of the Canadian Medical Association at Vancouver.

mass can be felt in the region of the gall bladder, and sometimes rigidity is so marked that no definite conclusions can be drawn from palpation. The colour of the conjunctiva and the skin may reveal a tinge of jaundice. Certain combinations of symptoms and signs may aid us further in estimating the extent or severity of the disease.

Biliary colic, with distended gall bladder, transient tinging of the conjunctiva, and a trace of bile in the urine indicates blocking of the cystic duct.

Biliary colic, with deep jaundice of skin and conjunctiva, clay-coloured stools, and a large amount of bile in the urine indicates a blocked common duct. It should be borne in mind that a stone in the common duct does not always produce jaundice. Clute[1] reports a series of cases of common duct stones in which 39 per cent were free from jaundice.

Biliary colic, with a rigor at the onset, or continuing pyrexia means empyema of the gall bladder or suppurative cholangitis.

Persistent jaundice, whether yellow, green or darker colour, with distended gall bladder and enlarged liver means malignant stricture of the common duct. If the fæces contain fat or meat fibres, in addition to being clay-coloured, it indicates carcinoma obstructing the ampulla. Most patients with cholecystic disease will give sufficient history and have sufficient physical signs on which to make a diagnosis.

CHOLECYSTOGRAPHY

In 1923, Graham and Cole introduced cholecystography to the profession, and in the seven and one-half years that it has been extensively used by the profession we should now be able to estimate its true value. We cannot estimate its value, however, without considering to some extent the function of the gall bladder and liver, as cholecystography is a test of function rather than an estimation of disease. Although physiologists still disagree as to the function of the gall bladder, this much can be said to have been sufficiently proved to be accepted by most. The gall bladder is a reservoir where bile is received from the liver by way of the cystic duct, and in which the bile is concentrated and absorbed. The bile is concentrated (20 or 30 times) liver bile, and absorption amounts to about 1,200 c.c. of bile per day. In the process of absorption bile acids, bilirubin and cholesterol are returned to the circulation by way of the gall bladder wall. That the wall is capable of absorbing all the biliary constituents is proved by hydrops of the gall bladder. Sweet[2] maintains that it absorbs all the bile and that none is normally ejected through the cystic duct. That it does absorb its contents is admitted by all. That it is capable of emptying its contents under certain conditions seems to be the consensus of most roentgenologists. On these observations cholecystography depends. Tetraiodophenolphthalein-sodium is administered to the patient, either orally or intravenously. Its administration is followed by taking a series of x-ray plates to ascertain whether or not the dye enters the gall bladder. If it enters the gall bladder, does it become concentrated and is it evacuated in the normal time? Opinions differ as to whether the oral or intravenous method should be used. Theoretically, the intravenous method should be the more accurate. In most reports made on the accuracy of cholecystography the oral method is the method referred to, and this seems to be the method in general use.

Eusterman[3] estimates the accuracy of the oral method at 91.9 per cent. Miller and Waters[4] give 83.3 per cent in cases operated on and 89.7 per cent in cases not operated on. Feldman[5] gives 94 per cent; Mooney[6] gives 89.4 per cent. Nowhere have I found an observer to suggest that the dye test is perfect or infallible, and I would like to make this observation, that, although we have in cholecystography one of the most reliable of laboratory tests, its reputed imperfections are mainly due to the fact that some clinicians expect it to test 100 per cent perfect. Santee[7] places the greatest diagnostic value where the gall-bladder is not visualized at all and in the positive visualization of stones and abnormalities with slow emptying time. Moore[8] states that the possibility of error of diagnosis is greatest in pericholecystitis, cholesterosis and cholelithiasis.

It would appear that cholecystography, although useful, has its limitations, and should be used to assist us in cases of cholecystic disease where symptoms are not definite and the diagnosis is obscure. This is often the case in the so-called chronic cholecystitis without stone,

which is often difficult to diagnose and yet may be the cause of serious systemic trouble.

The old theory that infection enters the gall bladder by ascending the ducts has been superseded by the theory that infection is carried by way of the blood stream. D. P. D. Wilkie[9] has shown the importance of blood-borne bacterial emboli being carried from remote foci in the production of cholecystitis. The gall bladder, once infected, may be a very potent source of poison, and the origin of chronic arthritis, myocardial degeneration, renal affections, and affections of the nervous system. In this type of diseased gall bladder the pathological changes are those seen in chronic inflammation everywhere, namely, lymphatic infiltration and the production of fibrous tissue changes. The same change takes place in the wall of the ducts and the gall bladder, as they are identical in structure. This chronic inflammation interferes with the concentration of bile. Bile salts, bilirubin and cholesterol are no longer absorbed and returned to the circulation in a normal manner. The gall bladder ceases to function and becomes a pest-house of bacteria from which infection spreads to various organs and tissues throughout the body. A. L. Wilkie[10] isolated streptococcus in 84 per cent, of cases of this type. Gordon-Taylor and Whitby[11] isolated *B. Welchii* in 9 per cent of gall bladders removed and were able to obtain *B. Welchii* in the centre of stones in 13 per cent of post-mortem cases.

It is in the infective type of case that cholecystography is most useful. If the dye enters the gall bladder it is not absorbed and does not concentrate. When the cystic duct is blocked it does not enter at all. That the tetraiodophenolphthalein-sodium, injected intravenously, might materially affect the action of bacteria is suggested by Nickel.[12] Whether it could be relied upon early to work a cure in cholecystitis will be interesting to follow. That it would be necessary to employ it early is clear, as in late cases the dye does not enter the gall bladder as the cystic duct is occluded.

Blood Chemistry

We have at our disposal certain tests which have for their object the estimation of bilirubin in the blood. The estimation of blood bilirubin is just as important in certain conditions of cholecystic disease as a blood sugar test is in pancreatic disease. These tests are known as the van den Bergh reaction and the icterus-index test. To van den Bergh belongs the credit of first demonstrating that the traces of bilirubin in the normal blood serum are of extrahepatic origin. He was also first to point out that the amount of bilirubin in the serum becomes immediately increased when certain disturbances of the liver are present, and when intensified decomposition of the blood occurs. An increase in the amount of bile pigment in the circulating blood is a forerunner of jaundice. If the reaction is immediate or direct, as it is called, it indicates an obstructive jaundice. When no direct action has been given, but a perfect indirect reaction results after alcohol precipitation, then we can infer that the jaundice is either hæmolytic in origin or dependent on derangement of liver cells without obstruction. McNee[13] states that the chief value of the van den Bergh test is in differentiating jaundice due to obstruction of main bile duct by carcinoma, hepatic cirrhosis, obstruction in the portal fissure, or stones in the common duct, on the one hand, from jaundice of hæmolytic origin, or jaundice due to functional derangement of liver cells, on the other. The test is also useful in ascertaining the progress or decline of jaundice already developed. When frequent records of the test are kept graphically they will reveal a bilirubin curve. In obstructive jaundice as the obstruction is relieved the curve sinks lower and lower; a rising curve indicates an increase in obstruction and signifies that operation should be delayed, as operation will likely be followed by profuse hæmorrhage; on the other hand, a decreasing curve indicates that operation may be undertaken safely long before the skin and sclera have lost their jaundiced appearance.

Conclusions

In diagnosing cholecystic disease, most reliance can be placed on a painstaking study of the clinical symptoms and ordinary physical signs.

In obscure cases some valuable assistance can be obtained from cholecystography and blood chemistry.

Cholecystography should not be looked upon by the clinician as an infallible test, but rather as a refinement in diagnostic methods.

The serum pigment curve may be utilized to

advantage in estimating when operation may safely be performed.

Cholecystic disease in its present status is a surgical condition.

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LUMBAR RAMISECTION AND GANGLIONECTOMY*

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THE original observations of Claude Bernard in 1851 are credited with starting what has been termed the first wave of enthusiasm, augmented by Gonnesco in his clinical study of cervical sympathectomy in the treatment of epilepsy, in 1896. This period, however, appears to have been short-lived until Leriche, in 1915, became enthusiastic, and he is credited with introducing the second wave. He was supported by Gonnesco in 1921.

Surgery of the autonomic system may be divided into three sections.

1. *Periarterial.*—This consists of the stripping off of the collar of the sympathetic network lying in the adventitia of the artery. This results in a temporary spasm of vaso-constriction, followed by vaso-dilatation, which lasts over a period of from days to weeks.

2. *Ramisection.*—This is the cutting of the rami communicantes as they leave the intervertebral foramina to join the paravertebral sympathetic system.

3. *Ganglionectomy.*—This is the extirpation of certain ganglia of the sympathetic trunk. After the removal of the second, third, and fourth lumbar ganglia, there is a well marked vaso-dilatation in the lower limbs and feet, with a rise of skin temperature, a sensation of warmth felt by patient, and the so-called "feeling of life", also, a marked change of dryness of the legs and feet.

The therapeutic applicability of sympathectomy in circulatory disorders depends upon the conclusion that all, or most, of the vasoconstrictor fibres of the part are thrown out of action by the operation. The conditions warranting sympathectomy are numerous, and although a great deal of experimental work has been done, there are some disorders which react to ramicotomy, ramisection, and the more drastic operation of ganglionectomy, with more outstanding results than others.

In surgery of the sympathetic the vasomotor index, which may be obtained by different methods, is calculated by recording the change of skin temperature, subtracting the temperature by mouth, and dividing by the temperature change by mouth. In ideal cases it is stated that there should be a +5 index, but, unfortunately, we are dealing with chronic cases as a rule in this work, and they usually have a lower index, where complete relief is probably very seldom obtained, but we do expect and obtain some improvement.

The conditions which respond to this type of surgical procedure, and in which we believe it is justifiable, are:— scleroderma, chronic ulcers, cold extremities (especially following infantile paralysis), chilblains, obstipation, uncontrollable dysmenorrhœa, irritable conditions and malignancies of the bladder and rectum, pain in amputation stumps, Raynaud's and Buerger's diseases.

However, there are other disorders in which ramicotomy or ganglionectomy have their supporters, and perhaps justifiably.

We present a synopsized report on four cases, as follows.

Case 1

A young lady, aged 22, complaining of chilblains in the right leg. Twenty years ago she had had infantile paralysis and had suffered a great deal with coldness and chilblains in the right leg. In the last two years ulcers had developed, which, in our estimation, were probably due to poor circulation in this leg.

Personal and *family histories* were negative.

Physical examination.—The right leg was underdeveloped (post-infantile), cold, and with evidence of ulcers over the external tibial muscles.

Right ganglionectomy was performed under ether anæsthesia.

* Read before the Hamilton Medical Society, March 23, 1931.

Progress notes showed marked improvement in sensation and warmth, noted for a period of three to four days, after which the leg became a little cooler. This persisted for a period of ten days or more.

Follow-up notes on this patient show very noticeable improvement in every respect. There are now no sensation of coldness, no chilblains, no ulcer formation.

CASE 2

A child, aged 3, with obstipation. The mother stated that since birth he had been constipated and had never had a voluntary bowel movement, even with the administration of oils and anti-constipation diet. Enemata had to be given every other day. One year ago his condition was diagnosed as megacolon, after a barium colon x-ray.

In February of this year, we had the child admitted to hospital, and after clearing out the bowel by means of enemata, an x-ray was again taken which revealed a normal colon. There was no evidence of Hirschsprung's disease. A diagnosis was made of obstipation, and on February 21st a left ramicotomy was performed.

Progress notes on this child showed the left leg to feel dry and warm immediately on return to the ward. For the two days after operation enemata were given, and on the fourth day the child had a voluntary movement for the first time in his life. These movements continued regularly except for a temporary stage of constipation at home. No drugs or enemata were used.

The microscopic findings reported by Dr. Deadman, pathologist at the Hamilton General Hospital, showed a marked round cell infiltration of the left sympathetic with an increase in the fibrous tissue, indicating chronic inflammatory change. (See Fig.).

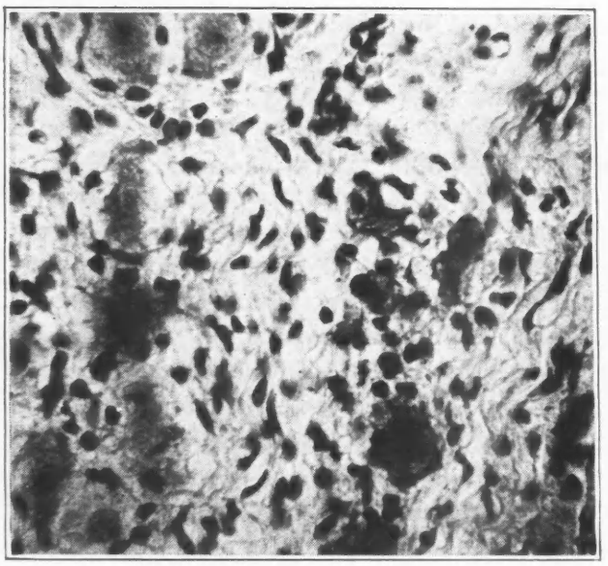

FIG. 1.—*Case 2.* Section of ganglion. High power showing round-celled infiltration.

CASE 3

Male, aged 22. He had had infantile paralysis when one year old, with resulting deformity of both legs. An arthrodesis of the right foot was done in 1924, in an attempt to benefit the patient's condition, but at the time of examination he was complaining of pain in both legs, from the knees to the soles of his feet. There was marked coldness and clamminess of both feet. He was seen by a consultant, who advised ramisection. On January 16th a right sympathectomy was done. Grossly, the nerve was very much enlarged over the normal, and the ganglion, correspondingly. Immediately after the operation there was a distinct feeling of warmth discernible in those in attendance and to the patient himself. However, on the fourth day a slight pain developed in the sole of the foot, which gradually progressed to the ankle and then to the knee. After consultation, it was decided to remove the left ganglion, as there was the possibility of a communicating fibre. This was done and was followed by some relief.

The pathological report, given by Dr. Deadman, on the right sympathetic nerve, is as follows. "Section of this tissue shows the presence of a diffuse round-celled infiltration of the tissue, and an increase in the interstitial tissue. There are numerous small areas of hæmorrhage. Histologically this shows chronic inflammatory change." The report on the left sympathetic nerve states, "Section of the left sympathetic nerve shows a slight degree of round-celled infiltration. There appears to be some increased fibrosis of the interstitial tissues as compared with a normal ganglion removed at autopsy. This shows chronic inflammatory change."

This patient has a very marked kyphosis which has gradually been increasing, and x-ray plates show the spine at the 8th, 9th, and 10th dorsal vertebræ to be almost at a right angle. Although he improved somewhat after ganglionectomy, responding with warm and dry feet and some relief from his pain, we believe that the spinal deformity is the cause of the present pain, as when he is stretched on a Bradford frame and extension is applied, the pain in the limbs subsides somewhat.

CASE 4

A child, male, aged 9. The history, obtained from the family, stated that the child was unable to walk until he was two and a half years of age, when he was able to pull himself up by so-called "walking up his legs", and finally reaching a standing position, which he could keep for a short time before collapsing. For seven years there had been very little change until this year, when he apparently lost what little movement or strength that he had had in his limbs. Whenever he wished to move his legs, even the distance of an inch or two, he would have to be assisted by one of the family. He was unable to draw his legs upwards and the ankle or knee pull was practically negative. A provisional diagnosis was made of progressive muscular atrophy, and a double sympathectomy was performed.

The progress of this child has been rather remarkable, in that the strength of both legs and feet has been improved to rather a marked degree, accompanied by a greater freedom of limb movements. He now is able to move his knees up to his chin, alternately and together, even with some rapidity. Muscular pull from the knees is 7 lbs. with the right leg; 8 lbs. with the left leg.

The pathological report on the sympathetic ganglia from the right side states, "Transverse sections of these ganglia show congestion of the vessels and a mild degree of round cell infiltration. This is chronic inflammatory change. The pathological report on the left nerve reads, "There is intense infiltration with round cells, which are scattered throughout the tissue and also occurring in large collections in some areas. This shows a very marked degree of chronic inflammatory change."

The above cases are submitted as examples of four types which have responded to ramisection or ganglionectomy with very satisfactory and encouraging results, as progress notes indicate. There is no doubt that, at the present time, sympathectomy is in its infancy, and we are going to learn a great deal regarding the indications and the advantages to be secured from this type of operation.

THE IMPORTANCE OF ANOMALIES OF THE SUPERIOR VENA CAVA IN MAN

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KÖHLER[1] has drawn attention to the importance of a careful study of the aortic arch and associated vessels in x-ray photographs of the thorax. He noted that the superior vena cava was visible in almost every case after the thirty-fifth year, and that it formed a part of the "aortic" or "vascular" shadow in frontal and oblique photographs. "In oblique views the posterior edge of the so-called 'aortic shadow' is always formed either by the vena cava superior or the vena cava projects a little way behind it." It follows therefore that an estimate of the diameter of the aorta must take into account the position and size of the superior vena cava. Hence anomalies of the large venous trunks in the upper thorax take on some practical importance in the radiological diagnosis of thoracic conditions.

The main venous trunks of the head and arm in the early embryo consist, as in the adult, of an internal jugular vein and a subclavian vein which unite to form a large venous trunk on each side of the body. These veins (the "anterior cardinal veins" of the embryologist) pass vertically downwards into the thorax and unite with two corresponding posterior cardinal veins to form two (a right and a left) large venous trunks — the ducts of Cuvier — which enter the primitive heart. Cross-anastomoses between the two anterior cardinal veins are developed, but only one of these which lies at the root of the neck normally persists in the adult. Changes take place in the lower part of the left anterior cardinal vein which result in the switching of all blood from the left side of the head and neck and left arm and from the left anterior cardinal vein into the right anterior cardinal by way of the cross-anastomosis between the two veins. Parts of the left anterior cardinal vein persist, but are not normally in continuity with the upper part of the original vessel. These persistent parts form: (a) the coronary sinus (in part); (b) the oblique vein of the left auricle (vein of Marshall); (c) the left superior intercostal vein, which may drain into the cross-anastomosis or into the azygos system. The cross-anastomosis between the two primitive anterior cardinal veins becomes the left innominate vein.

From a practical standpoint anomalies of the superior vena cava can be divided into three classes:— (1) persistence of both primitive anterior cardinal veins and the normal cross-anastomosis between them; (2) persistence of

TABLE I

	Fetuses	*Newborn*	*Children* 1–11	*Adults*	*Age unknown*	*Total*
Type I.						
Double superior vena cava with large anastomosis	4	3	–	9	2	18
Double superior vena cava with small anastomosis	2	–	2	10	–	14
Type II.						
Double superior vena cava with no anastomosis	19	10	5	17	13	64
Type III.						
Left superior vena cava with no trace of the right vessel	3	1	–	6	2	12
Persistent left vena cava; unclassified	2	2	–	2	6	12
Totals	30	16	7	44	23	120

both primitive anterior cardinal veins, but with no cross-anastomosis between them; (3) persistence of the left anterior cardinal vein, with obliteration of the right. Persistence of the right anterior cardinal vein with obliteration of the left is the normal arrangement.

Many anomalies of the superior vena cava have been recorded, but most fall into the three main groups. McCotter[2] has reviewed the literature and has segregated as far as possible the types and the ages of the individual in which the anomalies were recorded. He was able to find 120 cases.

Since the publication of McCotter's paper, Halpert,[3] Harris and Whitney,[4] Odgers,[5] and Thompson[6] have recorded between them 52 examples culled from the literature or from their own personal observations. The 3 examples recorded here bring the grand total to 175 cases reported in the literature.

One dares not attempt any statistical deductions from such a group of cases, many of which are badly recorded. There is no doubt whatever that anomalies of the superior vena cava are not incompatible with life, and that types I and II far outnumber type III.

Ancel and Villemin[7] suggested that the obliquity of the cross-anastomosis governed the amount of blood flowing through the channel, and hence through one or other of the primitive anterior cardinal veins. In this way they accounted for the persistence of one or other of the anterior cardinal veins. If the anastomosis was not present, or almost horizontal, they believed that of necessity two venæ cavæ must persist.

PERSONAL OBSERVATIONS

Type I.—The first specimen was taken from the body of an adult male, aged about 55 years. The previous history of the patient, as discovered from hospital records, did not show anything abnormal. The heart was large and appeared dilated. There was no sign of atheroma or other pathological change in this heart or in any other of the three specimens recorded here. The left superior vena cava in this specimen persisted alongside a fully developed normal right inferior vena cava. There was a cross-anastomosis between the two superior cavæ, but it was very small. Into it opened the internal mammary vein of the right side. The internal mammary vein of the left side opened directly into the left superior cava. There was no sign of a left azygos vein in this specimen. The course of the abnormal vessel was identical with that of the third specimen. No other anomalies were found. The "coronary sinus" was large and formed a bulge on the inferior border of the left atrium. There was no communication between this cavity and the vessel. The point of entry of the cava into the right atrium was in the normal position for the coronary sinus.

Type II.—The second specimen resembles the first specimen described in that the two superior cavæ persisted together. It differs in that there is no sign of a cross-anastomosis between the right and left sides. The specimen was obtained from the body of an adult female of poor development, aged about fifty years. The left cava drained the blood from the left side of the head and neck and the left arm. Into the vessel entered a small left azygos vein. The course and termination of this abnormal vessel resembled exactly that described for the preceding specimen.

Type III.—The third specimen was found in an adult male, aged about seventy years. The normal right vena cava was absent and there was no trace of any dimple or depression on the atrial wall where the vein would enter normally. The persistent left superior vena cava was formed by the junction of the left subclavian with the left internal jugular vein. Into this junction a right innominate vein drained at right angles. There was nothing corresponding to a right azygos vein on the right side. The left azygos vein hooked over the root of the left lung lateral to the arch of the aorta. On tracing the vena cava downwards into the coronary sulcus, it was seen that the vein entered into the right atrium at the normal site of entry of the coronary sinus. There were no other anomalies. This case is obviously one where there is a complete suppression of the right limb of the sinus venosus and the right cardinal veins in the thorax. There is a normal cross-anastomosis between the right and left anterior cardinals in the neck, to form a right innominate vein through which the blood from the right side of the head and neck and the right fore limb enters the abnormal venous trunk. The so-called "right innominate" here is the representative of the normal adult left innominate vein.

These three specimens are of interest as they illustrate three stages in the transition from a normal condition to the completely abnormal condition of a left superior vena cava. The second specimen shows a persistence of the fetal condition, but without any development of a cross-anastomotic channel. McCotter has collected records of fourteen cases. They are thus much rarer than the preceding example. It follows from these cases, and from the others recorded by the same author as having a normal cross-anastomosis, that such a cross-anastomosis may either have no influence on the obliteration of the left anterior cardinal, or that such a channel may not develop until development has progressed so far that even when fully formed it does not interfere with the persistence of the abnormal route for the blood through the left superior cava.

The third specimen illustrates a completely abnormal development of the anterior cardinal system. The normal right cava has been obliterated and the left remains. The normal cross-anastomosis has been developed. The mechanics behind the production of this specimen are not at all clear. The condition would

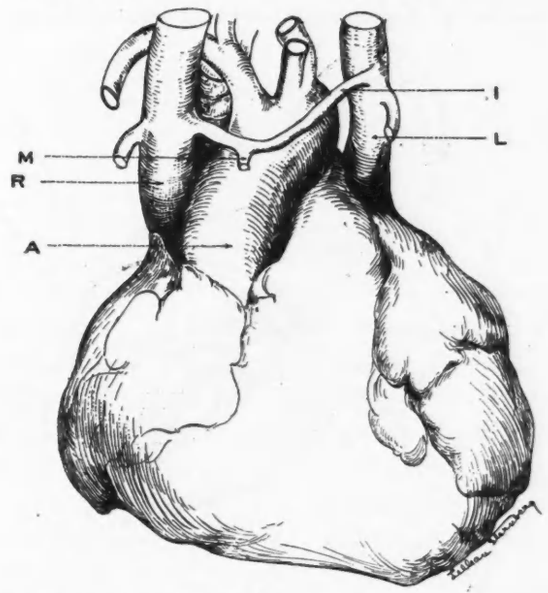

FIG. 1.—The first specimen (Type I), viewed from the anterior aspect to show the small calibre of the cross-anastomosis between the two venæ cavæ.

A.—Aorta. I.—Cross-anastomosis or normal left innominate vein. L.—The abnormal left superior vena cava. M.—Right internal mammary vein. R.—Right superior vena cava.

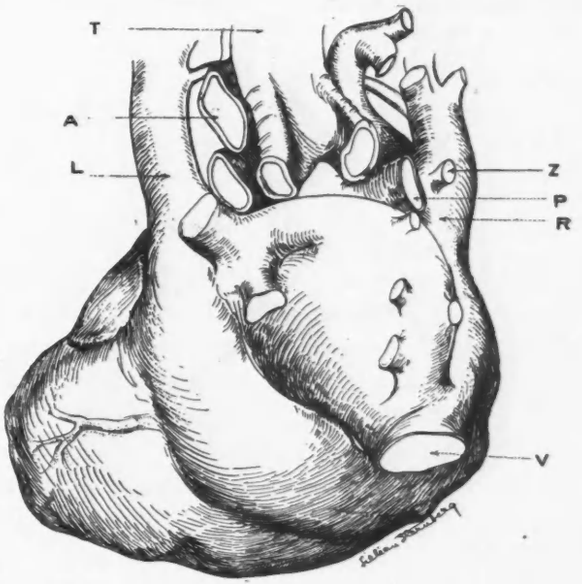

FIG. 2.—The first specimen (Type I), viewed from the posterior aspect to show the continuity between the left superior vena cava and the coronary sinus.

A.—Aorta. L.—The abnormal left superior vena cava. P.—Pulmonary artery. R.—Right superior vena cava. T.—Trachea. V.—Inferior vena cava. Z.—Azygos vein.

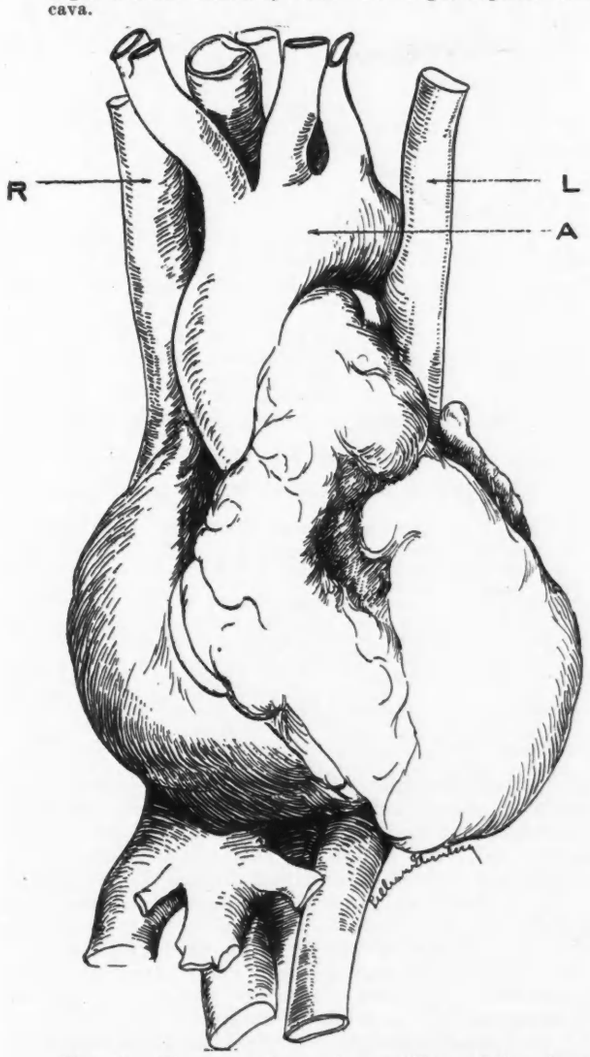

FIG. 3.—The second specimen (Type II), viewed from the front to show the absence of a cross-anastomosis.

A. Aorta. L.—The abnormal left superior vena cava. R.—Right superior vena cava.

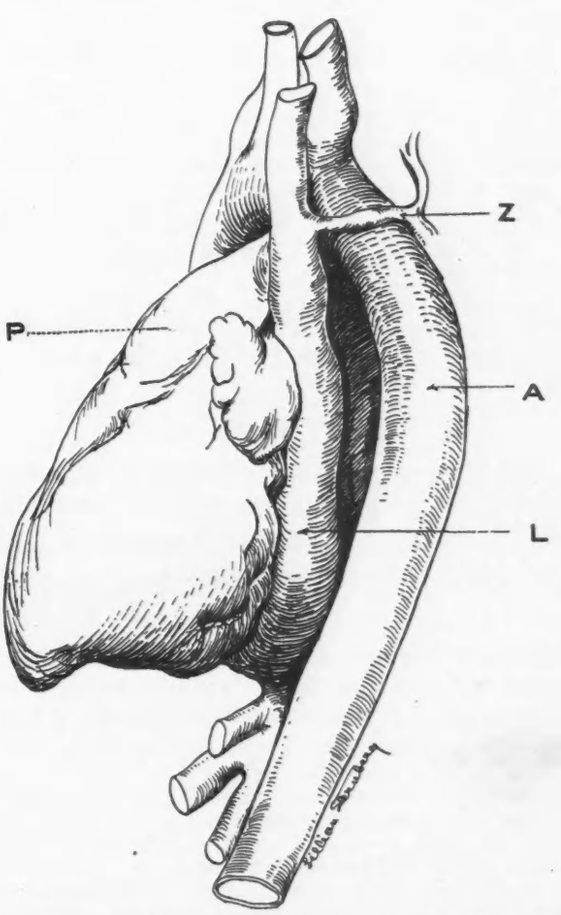

FIG. 4.—The second specimen (Type II), viewed from the left side, to show the relation of the abnormal vena cava to the descending aorta.

A.—Aorta. L.—The abnormal left superior vena cava. P.—Pulmonary artery. Z.—Azygos vein.

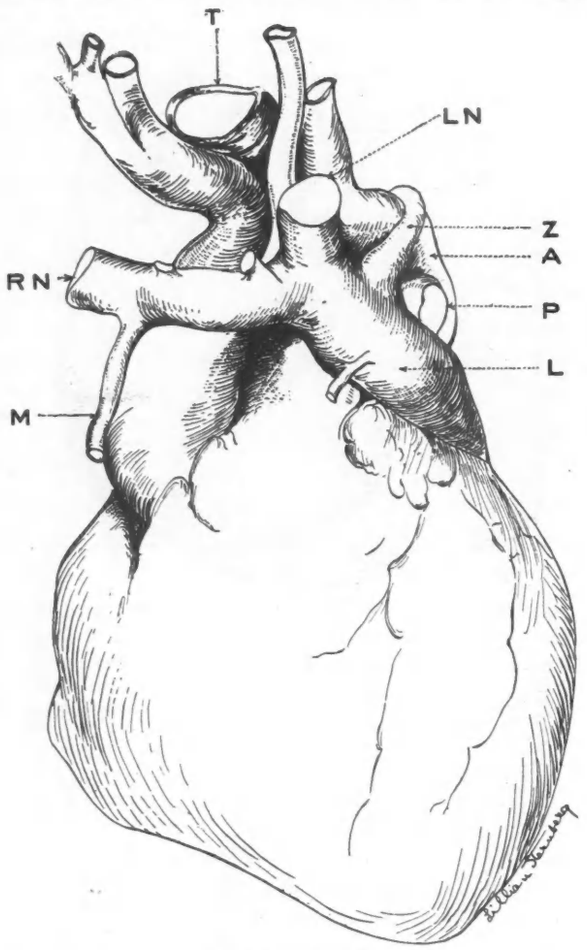

FIG. 5.—The third specimen (Type III). Note how, with the absence of a normal right superior vena cava, the upper part of the right margin of the heart is formed by the ascending aorta.

A.—Aorta. L.—The abnormal left superior vena cava. LN.—Left innominate vein. M.—Right internal mammary vein. P.—Pulmonary artery. RN.—Right innominate vein. Z.—Azygos vein.

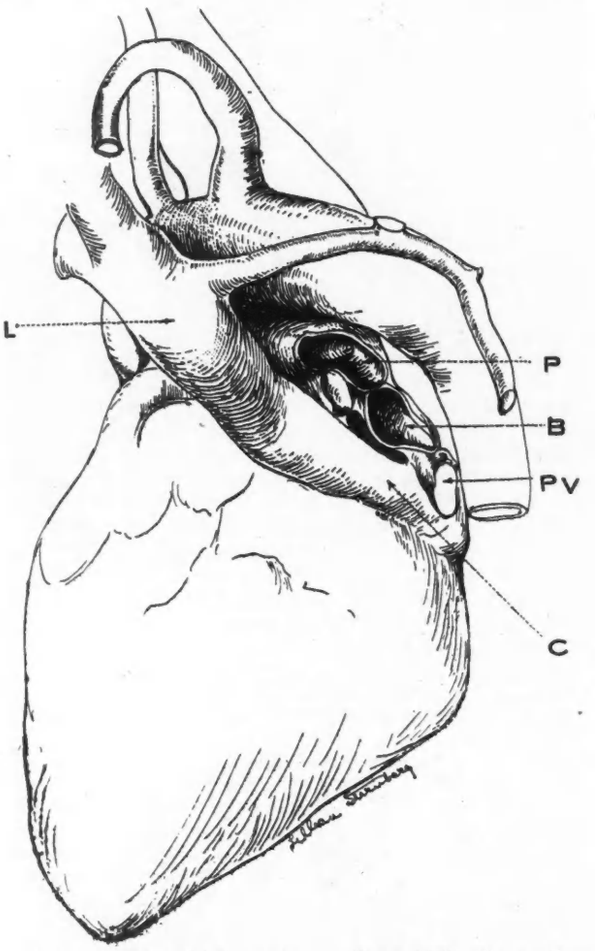

FIG. 6.—The third specimen (Type III), illustrating the continuity of the abnormal vena cava with the coronary sinus. Note the abnormal vena azygos crossing the aortic arch.

B.—Bronchus. C.—Coronary sinus (left duct of Cuvier). L.—The abnormal left superior vena cava. P.—Pulmonary artery. PV.—Pulmonary vein.

seem to have been well established before the formation or completion of the atrial septum.

SUMMARY

The presence of anomalies of the great venous trunks in the upper thorax must be considered when a diagnosis of aortic enlargement is made from radiograms of this region.

Three examples of such anomalies are described. In each the whole extent of the left anterior cardinal vein persists.

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DELIVERY AFTER CÆSAREAN SECTION.—Dr. Hornung reports in the *Centralblatt für Gynäkologie* on his experiences of conducting labours in women who had had Cæsarean section performed at a previous delivery. In 57 out of 111 cases the delivery took place in the natural way. To avoid a rupture of the uterine scar, forceps had to be applied in 18 per cent of the cases. After the birth of the child manual interference often became necessary because of a partial or total fixation of the placenta on the scar; this happened especially in cases where a deep cervical section had been performed. The fixation of the placenta on the old scar led to profuse hæmorrhage and to a lesion on the uterine wall which might produce severe complications. Owing to the insufficient elasticity of the scar it might be stretched unduly and even ruptured. This complication was observed not only at the end of pregnancy, but also as early as the third month. A rupture of the scar need not be due to a fault in the technique of the suture; it is more likely to be due to repeated pregnancies at short intervals so that the scar has no time to become organized. Repeated Cæsarean section is, in Dr. Hornung's view, even more dangerous and should not be performed without very definite indications.—*The Lancet*, 1931, **1**: 1417.

THE TREATMENT OF HYPERTENSION*

BY JONATHAN MEAKINS AND WALTER DE M. SCRIVER,
Montreal

IN disease of the circulation indicated by an increase of the intra-arterial pressure we are faced with a physiological disturbance of the first magnitude. This is not only on account of the serious nature of the probable ultimate result but also on account of the frequency of its occurrence. Essential hypertension, or hyperpiesis, is probably the most common circulatory disturbance of the present day. We cannot conceive that it is more common than formerly. What seems most probable is that we have a clearer conception of its life history. Whereas at one time it was considered to be the result of syphilis and arteriosclerosis, we now know that syphilis plays no rôle in the causation of hypertension, and arteriosclerosis is a natural result and not a cause.

The reason for hypertension may be stated briefly to be an increase in the peripheral resistance in the arterial circulation. A good example is to be found in coarctation of the aorta. In this instance the exact situation of the resistance may be determined. In the case of essential hypertension the resistance would appear to occur in the arterioles or the capillary bed, the balance of evidence indicating that it occurred in the former. It is from this increase in circulatory resistance that all the subsequent anatomical and functional disturbances arise. During its early phases hypertension fluctuates considerably and there are no obvious permanent anatomical changes. It is therefore in its earlier phases that a permanent curb might be effected.

The exact cause of this condition is a mystery. It is true that there may be a number of associated phenomena, such as obesity, hyperthyroidism, gout and eclampsia, but the relationship of these to hypertension is still to be explained. From the point of view of therapy it would be obvious that their deleterious influence if any should be removed. In the idiopathic form the cause is still most obscure. It would appear, however, to be due to some vaso-pressor substance, or a sensitizing body to a vaso-pressor substance, but this we have been unable to demonstrate. Until the exact cause be known and be removable a true cure of hyperpiesis will be impossible, but in the meantime can a means be found to ameliorate this physiological exaggeration?

In the therapy of hypertension so many factors come into play that it is often difficult to evaluate the efficacy of drug treatment, as the result achieved, if any, may be due to some insufficiently recognized change in the habits or status of the patient. The literature abounds in claims for the success of this or that form of medication, whilst critical examination shows that the improvement was due to rest or to altered regime; or, where few observations of blood pressure were made, the observer succeeded in catching one of the numerous fluctuations which occur in most cases of hypertension even without treatment.

In this communication we wish to record our observations of the effect of three of the more recently used drugs, on patients suffering from what should be classified clinically as simple hypertension. The drugs are ergotamine tartrate, acetylcholine, and sodium sulphocyanate.

We have studied only the effect of the treatment on the blood pressure levels and pulse rates and do not take into account improvements of a psychic or subjective nature. In order to rule out the effect of rest and new regime, a control period of one week or longer was instituted at the commencement. When the blood pressure level had apparently become stabilized for several days, the test periods were commenced. Recognizing the well-marked variations in blood pressure during the course of the day, four observations were made, using the brachial artery by the usual auscultatory method, at 7 a.m., 11 a.m., 3 p.m., and 7 p.m., the average of these readings being taken for

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Read at the combined meeting of the British and Canadian Medical Associations, Winnipeg, August, 1930.

each day. As far as possible these observations were all made by the same individual. The patients were kept at rest in bed, and on a weighed diet, the composition of which with regard to protein, fat, carbohydrate, salt, and total fluids remained unchanged during the period of observation.

SUMMARY OF OBSERVATIONS

Ergotamine tartrate.—The physiological action of this drug varies with the dosage. In small doses it acts as a sympathetic stimulant, while in larger repeated doses it is a depressant. The effect of the oral administration was studied in 7 cases. The drug was given as a rule in divided doses, commencing with 1 milligram three times daily, increasing in some cases to as high as 6 milligrams thrice daily.

Of this series 5 of the cases showed no appreciable effect when the dosage was continued over periods of from five days to two weeks, the readings of the blood pressure remaining at the same levels as during the control period. In 1 case a temporary drop for two days of 20 mm. of mercury was noted, but the pressure returned to the previous level while medication was still continuing. The remaining 2 cases showed a definite lowering of the pressure, 40 mm. of mercury in one case after ten days of medication, and 30 mm. in the second after three days. With the discontinuance of the drug the pressure tended to rise, but did not reach the level at which it had been preceding the remission.

The most marked drop, associated with toxic symptoms, was noted in the case of a young girl, 18 years of age (not included in the above seven), with a probable coarctation of the aorta, accounting for a high brachial artery pressure which averaged 210/100 mm. during the control period. She was used in a comparative sense as a control. Ergotamine medication was commenced and the dose rapidly increased to 15 mg. daily. At this stage there was a rise to 240/120 mm., followed by a rapid drop to 140 mm. systolic pressure, with a diastolic pressure that could not be determined; associated with this drop nausea, vomiting and palpitation were prominent features. The drug was discontinued and the pressure rose by the fourth day to its previous control level. After several days of rest the same large dosage was again tried, but, though the subjective symptoms again developed, no change in blood pressure was noted.

It is of interest that only in the two cases with lowered pressure was there any slowing of the pulse, a pharmacological effect which would be expected from a drug the full action of which is to depress the sympathetic nervous system. It is possible that except in these large doses a true pharmacological effect is not obtainable if the drug be administered orally. As ergotamine is relatively expensive, and especially so when purchased on a prescription, very few patients could afford to continue for any length of time on such large doses. The results were definite in 29 per cent with a prolonged effect.

Further studies were made, in a new series of patients, of the effect of the drug when given intramuscularly. The preliminary stabilizing period was carried out as in the previous series, and on the day of the test blood pressure readings and pulse-rate were determined at five-minute intervals until a stable control level was reached. From 0.5 to 1.0 mg. of ergotamine tartrate was then injected into the deltoid muscle of the arm opposite to that on which the manometer cuff was placed, and the readings of pressure were continued at five-minute intervals for an hour, then every fifteen minutes for the next two hours, and at the regular intervals during the day.

In a series of 7 cases so studied it was observed that the maximum fall of blood pressure, varying from 20 to 40 mm. of mercury, took place within the first twenty to thirty minutes after the injection, and that by the end of the first hour the blood pressure had returned to the control level or even slightly higher, though in one case the depression continued for two hours. The pulse rate slowed on the average some 8 beats per minute, but in no case did it go below 60, the fall in rate being parallel to the decline in blood pressure. In 2 cases of this series there was no change noted in the blood pressure level; in 1 of these there was a definite slowing of the pulse; in the other no such effect was demonstrable. The results were definite in 72 per cent, with a temporary effect of one hour's duration.

Acetylcholine.—This substance, which is considered by many physiologists to be a parasympathetic stimulant, "the hormone of the vagus", has recently been used, chiefly in the

French clinics, in conditions of so-called "vascular spasm" to produce relaxation of the vessels. Its chief use has been in cases suffering from Buerger's disease, but it has also been tried in general vascular hypertension. In analyzing its probable pharmacological action we must conclude that if it acts as a parasympathetic stimulant it would constrict the venules and thus tend to raise blood pressure. In intravenous injections in animals it reduces blood pressure and slows the heart, and there is presumed to be a direct action on the arteriolar musculature, producing a relaxation of the wall, and thus a reduction in the peripheral resistance. Thanks to the kindness of Messrs, Rougier Frères who furnished us with a liberal supply, we were able to observe the effects of acetylcholine on the same cases which received the ergotamine intramuscularly. The injection was usually given on the day following that of ergotamine, using a similar technique of observation and administration, except that it was necessary to give a larger volume in the injection; the dosage varied from 0.1 to 0.2 g., freshly prepared in glucose solution.

In the 7 cases the maximum fall of blood pressure was from 25 to 45 mm. of mercury in 4 cases, with a drop only of 10 mm. in 1 and no change in the 2 remaining. The time of maximum effect was more variable than with ergotamine, ranging from 25 to 100 minutes after injection, the depression lasting approximately one hour longer before the control level was again reached; in 1 case the effect was prolonged for four hours. Slowing of the pulse, somewhat similar to that produced by the intramuscular injection of ergotamine, was noted, but, though not present in all the cases, was well marked in the 2 which failed to respond by a drop in the blood pressure. The results were definite in 72 per cent with a temporary effect of two hours' duration.

Ergotamine and acetylcholine combined.—To determine if any synergistic effect might be produced, the same patients, under the same conditions as before, were given the same doses of both ergotamine and acetylcholine at the same time. The results failed to show any augmentation over the maximum effect of the individual drugs in the same patient, and in the 2 who had failed to respond to either of the drugs when given separately there was no further effect from the combined dose. The pulse rate slowed in all the cases except 1, in which, however, there was a drop of 30 mm. of mercury in the blood pressure.

Sodium sulphocyanate.—Recently the sulphocyanates have again come into prominence in the treatment of hypertension. Numerous reports have been made, some of which show good results in that the pressure was lower during the treatment, while others failed to record any marked effect. The purpose underlying this treatment is rather empirical, unless it be based upon an attempt to reduce tissue oxidation.

Our patients were placed on a regime similar to that used in the previous experiments, and the drug was given in the form of a mixture three times daily. The first cases were given 4½ grains daily, as recommended by Westphal, but as no results were achieved the dosage was increased, up to as high as 12 grains daily in some cases, and continued over two weeks.

Of 7 patients studied the maximum average depression of blood pressure noted under this therapy was 30 mm. of mercury in 1 case only, 2 others reached 20 and 16 mm. while the remainder showed no effect, the average blood pressure level during therapy being at the same level as during the control period.

The difficulties of evaluating the effects of such a drug where insufficient observations are made is illustrated by one of the patients selected for study, who in the control period of ten days showed a sustained drop in pressure of 50 mm. If any therapy had been given in this period it would probably have received the credit for this appreciable change. A second case, which was studied over a period of two months, showed on sulphocyanate therapy a drop of 15 mm. for several days, with return to the original level while still receiving medication. The drug was discontinued, and shortly after a fever of unexplained origin developed for which salicylates were given. The blood pressure soon fell 40 mm., and remained at this level all through convalescence, with a rise of 10 mm. just before discharge.

One patient with moderate arteriosclerosis showed toxic effects while under sulphoncyanate therapy, becoming excited and disoriented. After the drug was discontinued these symptoms disappeared. A number of patients have been

seen by us suffering from serious symptoms over a prolonged period apparently the result of uncontrolled use of this drug. The results were definite in 14 per cent, doubtful in 29 per cent, but the liability to serious toxic effects does not warrant the continued use of this drug.

While we consider these carefully studied cases of more value than those where isolated observations are made, we were able to follow in the out-patient department some 6 patients who we felt confident were following directions as to treatment. Though these patients received from 9 to 12 grains daily, blood pressure readings at weekly intervals over many weeks failed to show any change in the level, except in one case observed for six months, in which decreases of 30 to 40 mm. appeared to coincide with the intermittent use of sulphocyanates. The results were suggestive improvement in 17 per cent.

CONCLUSIONS

We quite realize that these experiments do not warrant any definite conclusions in regard to the treatment of hypertension. But at the same time we believe that the results with intramuscular injection of ergotamine and with acetylcholine indicate that there may be a place for these drugs in the treatment of essential hypertension. One of the greatest difficulties in such a study is the uncertainty as to how long the disturbance has been in existence, and therefore what degree of permanent anatomical change has occurred. It would appear justifiable to conclude that the more incipient the case the greater is the effect of these drugs. But in such cases an experimental difficulty arises in the difficulty of obtaining a constant control level.

In cases of so-called malignant hypertension such a prolonged period of control observation is neither necessary nor justifiable, therefore the drug may be used immediately. The few cases of such a nature that we have been able to treat fully justified, by the prompt and prolonged fall of blood pressure, particularly with acetylcholine, a continuance of this therapy. However, a word of caution must be sounded against its too heroic employment, as serious symptoms of collapse may appear, as would be expected from the well-known pharmacological action of this substance.

THE TREATMENT OF ACUTE INTESTINAL INTOXICATION*

BY PEARL SUMMERFELDT, M.B., T. G. H. DRAKE, M.B., AND ALAN BROWN, M.B.,
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ACUTE intestinal intoxication has also been described under the names, cholera infantum, alimentary intoxication, toxicosis, and anhydræmia. The condition is characterized by a history of diarrhœa, vomiting and drowsiness. The patient, on examination, is found to be markedly dehydrated and usually has an enlarged liver. Very few gross pathological changes are found in the intestines on post-mortem examination, but the liver frequently shows considerable fatty change. The disease is most prevalent in the autumn months, and is probably due to an infection by an organism of the dysentery group.[1]

To date there is no specific therapy, the treatment being entirely symptomatic. The symptoms to be combated are diarrhœa and vomiting, which quickly produce a severe dehydration and change of the acid base content of the body. The absorption of toxin from the digestive tract is probably of minor importance.

Before attempting to treat the dehydration the changes in the acid base balance of the blood were studied. Estimations of the sodium, chloride, and bicarbonate content of blood serums were made in 22 cases of acute intestinal intoxication by standard methods at the time of admission to the hospital. In Chart I is shown the variation of the bicarbonate in these cases. Normally, this is 27 c.c. N/10 bicarbonate per 100 c.c. of serum. In every case studied, except one, there was a lowering of the bicarbonate content of the serum, that is, an acidosis was present. In some cases the acidosis was so marked as to be distinguished

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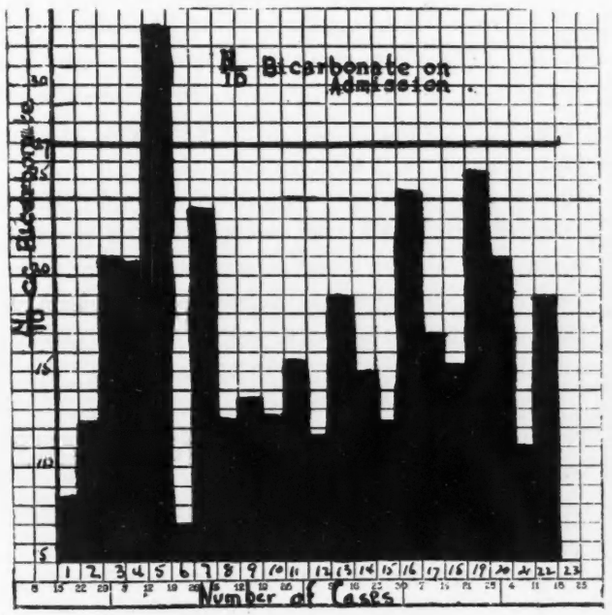
clinically by the cherry red colour of the lips, and by the deep rapid respirations. Observation of the breathing should be made when the child is undisturbed, for slight disturbances may markedly alter the character. This pre-

CHART I



The bicarbonate content of blood serum in cases of acute intestinal intoxication on admission. The normal bicarbonate is represented by heavy black line at 27 c.c. N/10.

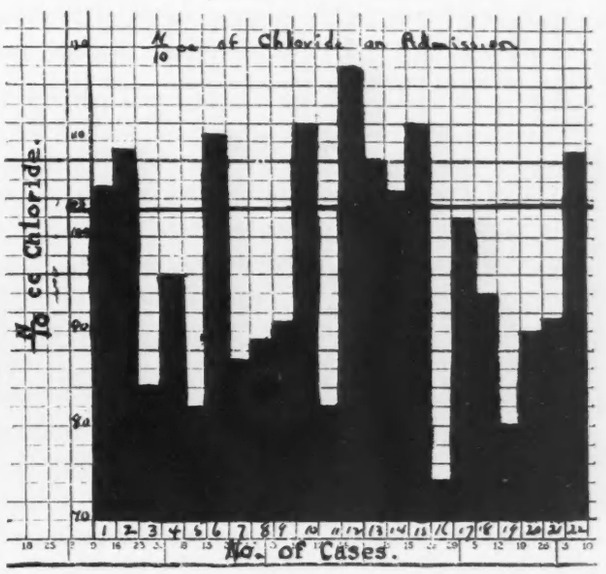
caution is also necessary in estimating the degree of toxicity present.

Chart II shows the amounts of chloride in the blood serum on admission. Normally this is 103 c.c. N/10 Cl. per 100 c.c. serum. In acute intestinal intoxication there are two main factors at work which bring about variations in the concentration of the chloride in the blood serum. Loss of hydrochloric acid, through vomiting of gastric secretion, brings about a decreased concentration. Loss of water, through the frequent watery stools, reduces the total volume of serum, and hence tends to increase the concentration of Cl. The interplay of these two modifying factors, one causing a reduction, the other an increase in the chloride concentration, explains the finding of a normal or increased chloride content in some serums.

In Chart III the changes of the sodium content of the blood serum are shown. Sodium normally makes up 133/157 of the fixed base of the blood. In all cases of acute intestinal intoxication there is a loss of alkaline intestinal content due to diarrhœa. This results in a decreased concentration of the sodium of the serum, which concentration is modified by the increased concentration of the blood through loss of water.

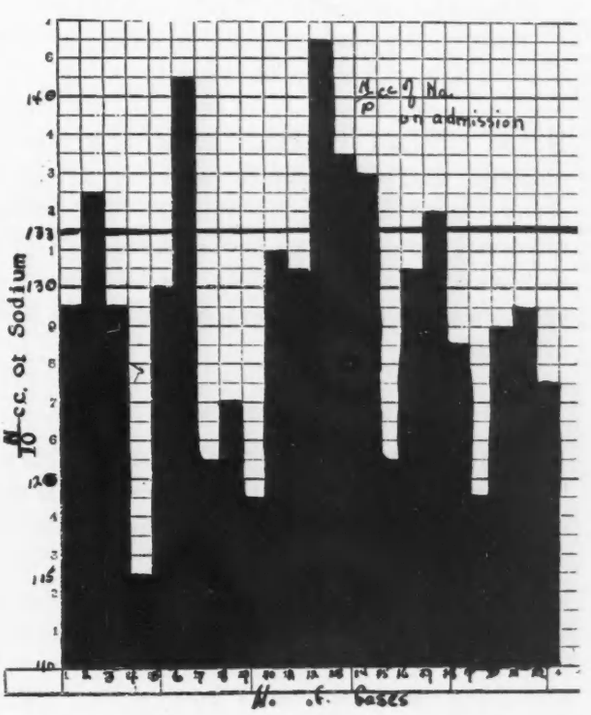
The amount of bicarbonate in the blood serum

CHART II



The chloride content of blood serum in cases of acute intestinal intoxication on admission, the normal chloride being 103 c.c. N/10.

CHART III



Sodium content of blood serum in cases of acute intestinal intoxication on admission, the normal sodium being 133 c.c. N/10.

is dependent upon the difference between the amount of fixed base, largely sodium, and the sum of the acids stronger than bicarbonate, this being largely chloride. From the figures obtained on blood serum it was found that the decrease in bicarbonate did not entirely depend upon the changes in sodium and chloride, but was partially due to changes in the unestimated acids and bases, as the concentration of protein, phosphate and sulphate increased through the loss of fluid from the blood.

DISCUSSION

Thus, taking these figures into consideration, the conditions to be combated in acute intestinal intoxication are the following:— (1) Dehydration, which is due to loss of water through diarrhœa and vomiting; (2) an acidosis, which is due to disturbances of the acid base balance brought about by (a) loss of bases through diarrhœa and vomiting, (b) increased concentration of acids through defective excretion, since the amount of water available for kidney function is lowered, and (c) accumulation of acetoacetic and B-oxybutyric acids, the result of insufficient metabolism of carbohydrates due to the persistent vomiting of food; (3) toxicity, resulting from dehydration and absorption of toxin from the intestinal tract.

It must be remembered that the total amount of fluid in the body is reduced below normal. This is shown by the inelasticity of the skin, loss of weight and thickness of the blood. Hence, though in some cases the sodium chloride and bicarbonate per c.c. of blood serum somewhat approximates the normal amounts, yet, due to the decrease of total amount of serum in the body, the total amounts of these substances present in the whole body are reduced.

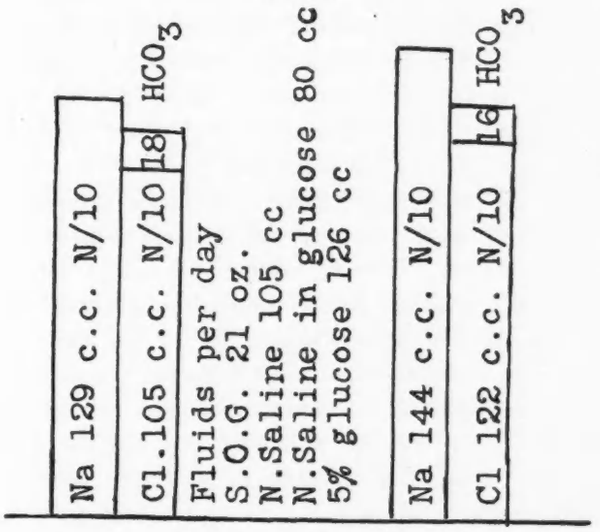
ROUTINE TREATMENT

In the autumn of 1929 the following routine treatment of acute intestinal intoxication was instituted in the Hospital for Sick Children. A direct transfusion of 15 c.c. of whole blood per pound of body weight is given as soon as possible. Subsequent transfusions, as indicated by clinical observation of the degree of toxicity, are given in 24 or more hours later. This measure helps in combating toxicity, through supplying water, acid and bases in their normal proportions. The administration of large amounts of fluids is necessary, but on account of the vomiting and diarrhœa, routes other than the gastrointestinal tract have to be used. Subcutaneous administration by gravity is the easiest, and less discomfort is produced in infants and children when the subcutaneous tissue of the abdomen is used instead of the axilla. The fluids injected subcutaneously are 5 per cent glucose solution, normal saline solution, or a combination of 5 per cent glucose and normal saline. Approximately 10 c.c. of the selected fluid per pound of body weight is administered one to three times a day, depending upon the rate of absorption. In severe cases where the dehydration cannot be remedied by the subcutaneous route, or if the degree of toxicity is marked, fluids should be given intravenously or intraperitoneally. Fluid is given intravenously through the longitudinal sinus. The same type of fluid is used as for interstitial injections in the quantity of 15 c.c. per pound of body weight. Intraperitoneally, about 20 c.c. per pound of normal or physiological saline solution can be administered at one time. In our experience it is not advisable to give glucose intraperitoneally because of the danger of intestinal distension.

When saline solution is administered to children with normal water content and normal kidney function, the body can retain the acid or basic substances as required and excrete the unwanted materials. In acute intestinal intoxication, in addition to a decreased water content of the body, there is frequently associated damage to the kidney, with a resulting impairment of renal function. Hence, substances administered are apt to be retained in the body in the concentration in which they are administered. Normally, blood serum contains 157 c.c. N/10 base and 103 c.c. N/10 Cl per 100 c.c. serum. In normal saline solution there are 154 c.c. N/10 base and 154 c.c. N/10 Cl. From these figures it will be seen that when normal saline solution is administered while the base and chloride are both retained in the body in the proportions in which they are administered, the amount of base per 100 c.c. of serum will remain unchanged, while the chloride will be increased. The extra chloride will bring about a lowering of bicarbonate, thus producing an acidosis. In Chart IV will be seen the effect

on the blood serum when parenteral administration of saline alone is given. The sodium has been increased above normal, but chloride is markedly above normal. As a result, the bicarbonate is reduced, producing a condition of acidosis.

CHART IV

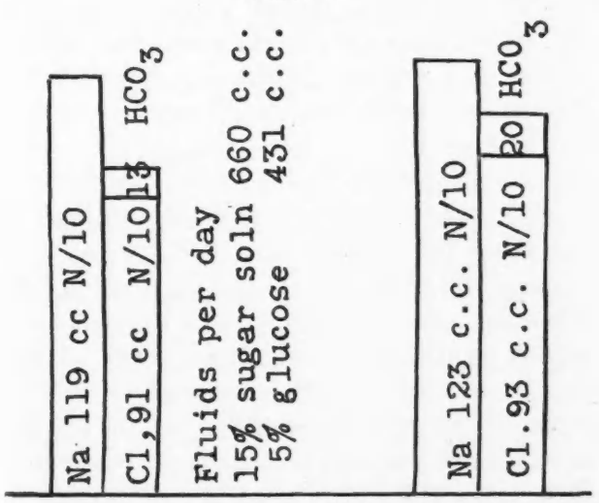


Changes in the sodium, chloride and bicarbonate of the blood serum produced by large amounts of saline solution given for 4 days.

Through the administration of glucose solution (Chart V), the kidney function is stimulated. The ketosis is combated and calories are supplied. There is also a decrease in the concentration of the blood, but acids and bases lost through diarrhœa and vomiting are not replaced.

It would appear that a combination of glucose and salt solution is most suitable. The glucose solution supplies water to correct dehydration, and for the excretion of unwanted acids and

CHART V



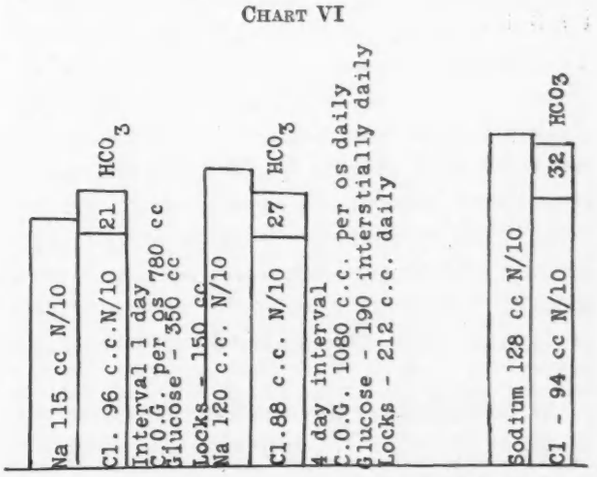
Changes in the sodium, chloride and bicarbonate of blood serum produced by large amounts of sugar solution given for 3 days.

toxic substances, and supplies antiketogenic material and calories. The saline solution supplies the bases and acids which have been lost through vomiting and diarrhœa. Here the best results are obtained when three-quarters of the parenteral fluid is administered in 5 per cent glucose solution, and one-quarter in the form of physiological saline solution. The parenteral administration of fluid is continued until the patient is able to take a normal amount by mouth and the clinical dehydration has disappeared.

During the acute stage of the illness milk feedings are contraindicated because of their poor toleration, *i.e.*, they accentuate the vomiting, diarrhœa and toxicity. The solutions given by mouth are either a 15 per cent sugar solution, consisting of 7½ per cent glucose and 7½ dextri-maltose, or a solution consisting of 1 part of 1 per cent sodium citrate, orange juice 2 parts, and 10 per cent glucose 3 parts (C.O.G.). This last solution, in addition to supplying water, anti-ketogenic substance and calories, also counteracts acidosis, due to the fact that in the process of digestion the organic acid is destroyed and bicarbonate is formed. The ice cold fluid is given in teaspoonful doses, not more frequently than every five minutes, with a total of 1 to 2 ounces per hour. If the vomiting is marked, the stomach is lavaged with a solution of sodium bicarbonate, 1 teaspoonful to the pint, a rest period of one to two hours is allowed, and fluid is again started. Chart VI shows the result of this treatment.

When the infant has been free from toxicity for about 48 hours, and vomiting has ceased, or is only occasional, milk feedings are started. These may consist of a mixture of evaporated

CHART VI



Changes in the sodium, chloride and bicarbonate of the blood serum when glucose and saline were given at the end of 24 hours and at the end of 4 days.

milk of half the concentration that would be ordinarily used for the patient according to age. An ounce of rice flour may be added. A dilute protein milk, one-third to two-thirds strength, is useful if the diarrhœa has been very severe. The C.O.G. is replaced very gradually by the milk mixture. If vomiting and toxicity recur the milk feedings are discontinued, and only C.O.G. is given for a further period.

The following mixture has been found of value in controlling the more severe types of diarrhœa.

Tinct. Camph. Co.	min. iii
Bismuth Salicylate	gr. iii
Mist. Cretæ ad.	dr. i
Sig. one teaspoonful before meals	

Just how successful this treatment has been it is too early to say definitely, but in comparing the mortality figures in the past five years we find in 1930 that there has been a slight decrease in the death rate.

Year	*Total Cases*	*Died*	*% Died*
1926	107	48	45
1927	67	26	48
1928	95	45	47
1929	172	75	43
1930	236	94	39

SUMMARY

1. Acute intestinal intoxication, a disease of the autumn months, is characterized by diarrhœa, vomiting and drowsiness.

2. The blood serum in acute intestinal intoxication shows a decrease in bicarbonate, that is, an acidosis. This is due to loss of base through diarrhœa and vomiting, and piling up of acids through failure of excretion. Loss of chloride through vomiting, and a reduced amount of serum through loss of water, modify the acid base concentrations.

3. The routine treatment of acute intestinal intoxication, as carried out in the Hospital for Sick Children, Toronto, is the following: transfusion of whole blood; the administration of fluids parenterally, one-quarter of the amount being administered in the form of normal or physiological saline solution, three-quarters as 5 per cent glucose solution; sodium citrate, orange juice and glucose solution, or 15 per cent sugar solution by mouth until the toxicity has disappeared; then diluted evaporated milk or protein milk formulas.

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A SIMPLE AND EFFECTIVE TREATMENT FOR INFECTION WITH TRICHOMONAS VAGINALIS*

BY JAS. R. GOODALL, O.B.E., B.A., M.D., D.Sc.,

Montreal

FOR the uninitiated it may be stated that trichomoniasis or trichomonad vaginitis is a disease caused by a flagellated plasmodial organism probably originating in the bowel, and *Trichomonas vaginalis* is considered to be the specific organism of this well recognized clinical type of vaginitis. The disease is characterized by a profuse liquid purulent vaginal leucorrhœa, causing an associated diffuse vulvitis. The symptoms arising from the latter are an intense pruritus, intertrigo, and acute pain on urination, due to the contact of the acid urine with the inflamed mucosa of the vulva.

On introducing the bivalve speculum the walls of the vagina are injected, tender, and the vault is filled with a yellow or greyish-yellow, thin, purulent liquid containing bubbles of air. The vaginal walls and portio vaginalis frequently present the strawberry appearance due to papillitis.

The disease is not transmissible (so far as is known) to the husband. It is most frequently mistaken for gonorrhœa. It is acute and chronic. The acute cases are easily diagnosed clinically; microscopically, the diagnosis is readily confirmed by a hanging drop of pus and normal saline. The organism is readily found by its motility and by the motion imparted to the pus cells in its immediate vicinity. It is impossible to demonstrate the organism during the douching treatment. Being a

* Received for publication August 3, 1931.

plasmodium, it readily succumbs *in vitro* to all the antiseptics, but, *per contra,* the disease produced is very tenacious as a vaginitis. The organisms disappear quickly after douching, but reappear a few days after cessation or after the subsequent menstruation.

The treatment presented here was prompted by the ineffectiveness and long duration of the generally accepted treatment, as laid down by previous writers. It consists in using an acid antiseptic in a medium which will slowly dissolve, thereby keeping the vagina in a constant bath of disinfectant. These two factors are obtained by using vaginal cones of 1 per cent picric acid.* A cone should be inserted high up in the vault on retiring. A simple neutral or acid (plain water or soap solution or lactic acid 3-1 to the quart) douche should be used once daily. After the third treatment with the cone, the whole vulva becomes stained a pale yellow, owing to the picric acid.

Ordinarily there is a strong tendency for the disease to recur immediately after the next or subsequent menstruation; a renewal of the cone treatment brings this recrudescence under control. Such a recurrence has taken place in only two of my cases, probably due to insufficient or improper cooperation.

The writer so far has treated 22 cases by this method—4 of these during pregnancy; 3 in the puerperium. The results have been uniformly successful. The average course of treatment is from five to ten days, and owing to its great simplicity is not irksome. The pruritus usually disappears during the first three treatments and the pus is generally absent after the fifth or sixth day. Desquamation goes on for some time afterwards. By the tenth day the mucosa has taken on a healthy appearance.

The treatment may also be carried out during pregnancy, provided it is not too near the period of the expected onset of labour. The distress from trichomonas infection during pregnancy is worse than at any other time. Should treatment begin just before menstruation the daily insertion of the cone should continue throughout the period and for some days afterwards.

One of the writer's cases had been previously hospitalized five times, one four times, and another twice for green soap lavage of the vagina and subsequent packing with gauze saturated with mercurochrome, iodine, etc., with only temporary relief, followed by the discouraging reappearance of all the symptoms after the next menstruation. These cases subsequently responded quickly and, so far, permanently to a course of picric acid treatment.

It is the writer's opinion that picric acid is a specific in trichomonas infection, owing to the satisfactory, rapid and almost constantly permanent results obtained from its use.

Judging these cases by the standard set up by Dr. Fred Holden—that a year must elapse without recurrence — the writer, perhaps, cannot claim cures because the treatment so far has been in practice for only about six months, and that only in a few cases. But he offers as an excuse for this preliminary report the desire to make this treatment available for those who wish to put it into practice; also, for the reason that it will bring speedy results far in advance of anything previously used. The writer looks forward with keen anticipation to the results of those whose available material is larger and more varied.

* As prepared by Wampole & Co.

A CASE OF DUPUYTREN'S CONTRACTURE.—In June, 1930, I was consulted by a single woman of 65 on account of the condition of her right hand. The ring finger was bent so much that the tip was level with the base and the little finger was flexed to about half this extent, the other fingers being normal. Neither of the affected fingers could be straightened, and two small tender nodules could be felt beneath the skin to the ulnar side of the middle of the palm. The patient attributed her condition to the use of a chopper in cutting wood. It was a typical Dupuytren's contracture. Wishing to try the effect of local treatment before advising operation, I prescribed a thorough inunction of the palm twice daily with ung. iodi. denigrescens. After about 10 days the treatment had to be suspended on account of a local dermatitis of the palm with the formation of blisters. Movement was already returning in the affected fingers, and, after a second course of inunction, which also resulted in blisters, they could be fully extended. The nodules in the palm had also nearly disappeared, but the grip, however, was weak, and when flexing all the fingers to form a fist the tips would not quite touch the hand. Subsequent exercises have rendered the hand quite useful, and in appearance perfectly normal. The patient states that she still notices a slight weakness of grip when wringing clothes. It seems to me doubtful whether the improvement noted in this case was due to the iodine absorbed, or to the hyperæmia which accompanied the dermatitis. In either case it suggests a possible method of treatment for a troublesome condition. — W. A. Trumper, M.R.C.S. Eng., in *The Lancet*, 1931, **2**: 17.

GONOCOCCAL VACCINATION IN CASES OF INFANTILE VULVO-VAGINITIS

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INVESTIGATION of the value of gonococcal vaccination in cases of infantile vaginitis was prompted by (a) the incidence of this infection; (b) the notorious chronicity of the disease in girl babies confined to institutions, and (c), by interest in such a vaccine as a prophylactic and as a therapeutic procedure. As early as 1877 Suchard[1] reported an epidemic of gonococcal vulvo-vaginitis. Later, Fraser[2] stated the incidence of such infections to be so high that all cases of vulvo-vaginitis should be looked upon as gonococcal in origin until proved otherwise. At the same time such cases had only been treated by local applications until Cole and Meakins[3] used vaccine in 15 cases of gonococcal arthritis and reported such a method of treatment to have a distinct value. One year later Butler and Long[4] treated cases of gonococcal vulvo-vaginitis with vaccine and found it to be more efficient than local treatments.

The following year Hamilton[5] treated 84 cases of vulvo-vaginitis with gonococcal vaccine and reported a cure in 84 per cent of the cases. Hess[6] then studied an epidemic in an institution where such an infection had existed for five years prior to the work of vaccine therapy. In this series all cases were given vaccine. In some patients, thought not to be infected, a pronounced vaginal discharge usually followed the second inoculation. This Hess claimed was due to the provocative effect of vaccine therapy and he considered it of great value in diagnosing cases.

In most of the baby hospitals of Montreal, cases of vulvo-vaginitis have been a serious problem. At Institution "A" all patients on admission were placed in cubicles for the first three weeks of their stay in the hospital. Routine vaginal smears were done. Patients showing positive smears were isolated and treated locally. Nevertheless, such cases continued to exist and from 1924 to 1929, 25 per cent of all girl babies admitted to the hospital developed specific vulvo-vaginitis. In November, 1929, there were 19 girl babies in the hospital; of these 5 were already diagnosed as having gonococcal vaginitis. A positive diagnosis was made on the presence of the following conditions: (1) repeated staining of the vaginal napkins with a thick tenacious greenish yellow discharge from the vagina and vaginal folds; (2) excoriation of the vulva and adjacent parts; (3) crying and discomfort of child during micturition; (4) the demonstration of intracellular Gram-negative biscuit-shaped diplococci in vaginal smears stained by Gram's method.

When the routine was followed out at institution "A" there was an additional case showing a positive smear, making a total of 6 infected patients and 13 clean ones. Six of the clean cases were to receive vaccine as a prophylactic measure and to be used as controls. The remaining 7 clean cases were not to receive vaccine and were to be used as controls, not vaccinated.

The stock vaccine used was made by a reliable firm and contained 4,000,000 killed bacteria in 1 c.c. of vaccine. The time limit for the potency of the vaccine was always one year later than the date on which it was to be used. All injections were given subcutaneously, and each subsequent injection was given into alternate arms. The dosage was as follows:—November 18, 1929, 1/20 c.c. vaccine; November 23, 1/5 c.c.; December 2, ½ c.c.; December 6, 1 c.c.; December 11, 1 c.c.; December 16, 1 c.c.

The local reactions were mild and there were no general reactions. On December 4th, after two injections of vaccine, two of the patients showed vaginal discharge and had positive smears. Prior to the vaccination these two had shown a very small amount of vaginal discharge on repeated occasions. There never had been positive smears; in fact so small was the amount of discharge before treatment that it was difficult to make smears. The vaccine in these cases had, no doubt, exerted a provocative effect and converted two silent carriers into florid clinical cases. These two patients were then isolated, thus making a total of 8 infected cases.

* From the Department of Pædiatrics, Royal Victoria Hospital, Montreal.

In January, 1930, two months after treatment had been begun, of these 8 infected patients, 6 had no further discharge and negative smears were obtained. The remaining 2 infected patients showed a small amount of discharge from time to time, but never any positive smears. Of the controls not vaccinated one developed typical specific vulvo-vaginitis. This patient showed marked excoriation of the vulva and surrounding parts, a most characteristic sign of such an infection. The vaginal discharge was thick greenish-yellow, copious in amount and of foul odour. This patient was sent to the infected ward, where a positive diagnosis was made. The other infected patients in the ward had received vaccine for two months. When the new patient was admitted they showed no exacerbation of signs or symptoms. Prior to vaccine therapy at institution "A", infected cases always showed a "flare-up" when exposed to a fresh case, regardless of the local therapy used.

The four clean patients given the vaccine were exposed by contact to cases of vulvo-vaginitis. For example, these patients were in the same ward as the above patients who developed the infection. All four vaccinated controls remained free from specific vulvo-vaginitis. They showed no signs nor symptoms, and their smears were negative repeatedly.

Encouraged by the results of this first series, a second group of cases were chosen at institution "A" and vaccine therapy started in institution "B". In June, 1930, there were 12 cases at institution "A" which had been admitted since November, 1929, and had remained free from infection. In addition to these there were 3 doubtful cases showing discharge from time to time, but never a positive smear. The control not vaccinated and infected still showed positive smears. These 4 patients, plus the 12 clean ones, were given vaccine therapy at the same time as the patients in institution "B".

In June, 1930, institution "B" had 16 girl babies. Eleven of these were positive cases of specific vaginitis; 5 cases were clean cases. These and the 16 at institution "A" were all given vaccine at the same time.* The dosage was the same at both institutions, depending on the age of the child which was from 2 months to 12 years. If under 3 months the initial dose was 1/20 c.c., if over 3 months 1/10 c.c. The subsequent dose was increased by doubling the first dose for the second dose. The following dose was increased 1/10 c.c. each time, and given on the fifth day following the previous dose.

Routine smears were taken of each case and repeated once. At the close of the treatment three smears were taken at six-day intervals. When three repeated smears were negative, when there was no further vaginal discharge, no excoriation of the vulva, no discomfort during urination, then the child was said to be cured.

* Local treatments
A. Solutions of silver salts, etc., all prior to vaccine.
B. Metaphen (instillations into vagina daily) given for 3 weeks — mid vaccination period.

SUMMARY

To summarize, 42 cases in all were treated; 19 of these were infected at the beginning of this work.

When the infected children received their second or third dose of vaccine they showed an exacerbation of signs and symptoms; then began to improve and in 16 cases a cure resulted.

During treatment of infected patients by vaccine, fresh cases sent to the ward did not cause an exacerbation of signs and symptoms as was the case before vaccine therapy was started at institution "A".

By the provocative effect of vaccine therapy silent carrier cases were converted into florid clinical cases, thus making the diagnosis of such cases evident.

Last, but not least, all clean children given the vaccine remained free from infection.

The degree of immunity produced is hard to measure. However, 7 months after the last inoculation these patients were still clean and institution "A" was free from infection for the first time in 5 years.

In submitting this paper the writer is grateful to Drs. W. W. Chipman, J. C. Meakins and H. B. Cushing for their instructive and constructive help.

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THE URINARY INFECTIONS OF PREGNANCY*

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THE complications of pregnancy in general call for accurate diagnosis and usually very prompt action. In probably no other branch of medicine is this better realized than in obstetrics. One of the most common complications of this condition is the subject of this paper, namely, urinary infections, and it constitutes a considerable percentage in both pre-natal and post-natal cases.

As a working basis we divide the urinary tract into two parts; the upper, which includes the kidneys and ureters, and the lower, including the bladder and urethra, the former, of course, being the more important from the standpoint of accessibility and seriousness when diseased. The latter, I wish only to consider casually, the former, more in detail.

The bladder is usually infected either from above or below. If a renal infection exists the bladder is consequently infected also. Likewise we may have, on account of the shortness of the female urethra, an ascending infection in cases of a vaginal discharge, which in turn may be due to a lacerated cervix, uterine malposition or a specific urethritis or vaginitis. The exception to this avenue of bladder infection is in cases of foreign bodies in the bladder, tumours, and residual urine caused from a previously over-distended bladder, a cystocele, diverticulum, or urethral stricture, which, by the way, is probably more common than is usually considered to be the case. In disposing somewhat hurriedly, I admit, of cystitis, I feel that the term is analogous to dyspepsia, and that some extrinsic condition is quite as likely to cause bladder symptoms as a duodenal ulcer or cholecystitis is to cause indigestion. No matter, however, where the source of the bladder infection may be, when it occurs it no doubt plays a very important rôle in the further infection of the upper urinary tract.

These infective renal conditions are classified for purpose of study into three groups:

1. *Pyelitis.*—Where the infection is confined to the pelvis of the kidney only.

2. *Pyelonephritis.*—Sometimes called infective nephritis, where the infection has progressed from the pelvis into the parenchyma of the organ, either by way of the tubules, the lymphatics, or both, or where the invading organism has arrived through the blood stream, sometimes causing small abscesses.

3. *Pyonephrosis.*—A relative condition of kidney destruction, varying anywhere from a distended and eroded septic pelvis to a complete pyonephrotic sac.

The three most common organisms found in acute urinary infections, whether complicating pregnancy or otherwise, are the colon bacillus, staphylococcus and streptococcus, while we frequently have our old friend the tubercle bacillus. The latter however presents a problem of sufficient importance to be dealt with by itself. Therefore I would limit this discussion to a consideration of the coincidence of these infections commonly occurring during pregnancy, with special reference to their cause.

In all renal infections there are three probable modes of entrance: (1) Hæmatogenous—from all parts of the body, including the bladder; (2) ascending from the bladder through (a) the lymphatics; (b) through the lumen of the ureter, in the urine.

That the kidneys become infected through the blood stream is almost beyond doubt; that they also excrete bacteria without becoming infected is also quite certain (Furniss[1], Sampson[2]).

Many apparently successful experiments have also been made to demonstrate that the lymphatics are the carriers of infection upward. Belief in this also implies a belief in the uninterrupted lymphatic chain from bladder to kidney and this is not yet definitely

* Read before the Section of Obstetrics and Gynæcology, Academy of Medicine, Toronto, November 6, 1930.

settled, although the preponderance of opinion is that there is a definite connection. Sweet and Stewart removed a portion of the ureter in a dog and replaced part of it with a piece of rubber tubing. They then infected the bladder and the dog died of peritonitis. The ureter on the cut side only showed inflammatory changes from the bladder to the point of contact with the tube. Eisendrath and Schultz[3] and Eisendrath[4] conclude that in pyelitis and pyelonephritis in human beings, secondary to infection of the bladder, the lymphatics constitute the most important cause of upward travel, especially in cases where there is no hindrance to the urinary out-flow.

Likewise many investigators have in turn tried to prove, and in some cases, I believe, successfully, that bacteria travel up the lumen of the ureter under certain circumstances. Rapid spread of bacteria into the tubules was observed after injecting them into a ligated ureter, by Von Wunscheim,[5] Albarran,[6] Schmidt and Aschoff.[7] Roosing[8] and Hess[9] believe that a stagnating urinary column, due to a partial or complete ureteral obstruction, is favourable to the upward spread of the organisms, especially those with independent motion, while others, equally eminent, claim that this is impossible. Of particular interest in regard to the question of urinary infection during pregnancy is the work done by Seng, of Montreal, who demonstrates a physiological occurrence of hydro-ureter with a corresponding lengthening and kinking, which predisposes to a retarded urinary flow, and consequent infection. As an argument against this, however, is the fact that we often see marked kinks and hydro-ureters with no evidence of back pressure or infection at all, but, given the condition which he describes, with a superimposed lymphatic or hæmatogenous infection, it is quite easy to understand a pyelitis of at least temporary duration. From the literature describing various experiments, I would conclude that most urologists believe in the probability of all three avenues of infection to the upper urinary tract under certain conditions, and while all this controversy still goes on among research workers as to the exact avenue of infection clinicians are continually making observations, some of which are also quite significant.

There was a time, not long since, when it was supposed that a so-called enlarged prostate or a retroverted uterus was a cause of obstructive constipation. Like many another popular idea this has been relegated to the scrap basket, but many still maintain that the pressure exerted on the ureter by the gravid uterus is a cause of pyelitis. With this it is difficult for me to agree. Nature has been too wise. Lying in a bed of soft cellular tissue in all its course and protected in front by the promontory of the bodies of the vertebræ, and with the cushion effect of the intestines, pressure as a cause seems absurd, unlikely, to say the least. Furthermore there are the following clinical observations to refute this theory. In passing a catheter up the ureter in simple cases of pyelitis during pregnancy, no more obstruction is encountered than in a case where pregnancy does not exist, and furthermore no gush of urine is seen as one would expect in back pressure. Where we have had the opportunity to demonstrate it, there were too many definite pathological lesions found in the more advanced cases to be a coincidence only. These will be referred to later. Pyelitis occurs before or after and at any time during pregnancy, from one month to term, usually six to seven months.

There is no doubt that simple pyelitis is an exceedingly common complication of pregnancy, but it is also a very common complaint in females generally. For instance in children, it is infinitely more common in females than in males. It was my experience in general practice to see many cases of simple cystitis in women. I still see many of them, and in nearly every case they are accompanied by an increase in the leucorrhœal discharge. With the exception of the pre-natal clinic where the same thing applies, hospital cases are different, and here we see more of the upper urinary infections with severe symptoms. In studying the histories of the in-patients at the General Hospital, from June, 1926, to December, 1929, we had 289 cases of pyelitis, pyelonephritis and pyonephrosis on the different services. Of these 71 were males and 218 were females,—a proportion of 1 to 4. The proportion of pyonephrosis cases was 15 males and 21 females; pyelonephritis, 39 males and 37

females; and pyelitis, 17 males and 152 females. The distribution in the services was as follows:

	Pyelitis		*Pyelonephritis*	
Obstetrics	49		2	
Gynæcology	19		6	
Surgery	63	17 males to	53	39 males to
Medicine	38	84 females	23	37 females

From the above it seems obvious that, so far as simple pyelitis is concerned, the cases are more common in females, by 4 to 1. This observation is also noted in the so-called pyelitis of infancy. It is my opinion that this difference is due to the probability of an ascending infection through the urethra into the bladder, due to the proximity of an infected vulva and vagina, thence to the kidney by the lymphatics. To lend weight to this theory we have the result of a study of 32 of these histories, in which 18 had pyelitis before delivery and 14 on an average of five days afterward. These figures might be misleading as to comparison if I did not state that in the pre-natal clinic there were many patients treated but not admitted; they were delivered at home. To be classed as pyelitis they had to have a temperature of 100°, pus in the catheter specimen of urine, with clinical symptoms of pain in the back and frequency.

You will note that as we come to deal with the more severe cases of pyelonephritis and pyonephrosis, the proportion of male cases equals that of the females. For this there must surely be a cause, and I believe that it is due to the fact that there is always a definite pathological lesion in the upper urinary tract, if it can be found, which is altogether independent of pregnancy, and a perusal of the histories will bear me out in this statement. Out of 42 female patients who were not pregnant 50 per cent were found to have some definite pathological lesion, while in 22 pregnant women of the same series 50 per cent also had lesions. By far the most common cause was a ureteral stricture, dilatation of which resulted in the symptoms subsiding. Nearly always in this class of case, there was a rapid flow of turbid urine, which escaped under pressure. Some of the other causes were kinks of the ureter, aberrant vessels, renal and ureteral calculi, congenital hydronephrosis and hydro-ureters, tuberculosis, ectopia, tonsillitis, carcinoma of the cervix, and renal ptosis. The following case in particular illustrates, I think, the observations of Seng.

CASE 1

A woman was confined in March, 1927. At that time she had pus in the left kidney and none in the right. The following June she was admitted to our service with a kink in the right ureter and a right sided pyelo-nephritis, for which a nephrectomy was done.

The remarkable extent to which a pyonephrosis can develop during pregnancy is illustrated by a case referred by Dr. Lloyd Burns.

CASE 2

This woman went through a normal pregnancy and delivery, although he was not consulted until called to deliver her. In searching for a cause of continued temperature in the puerperium, a large mass was found in the upper abdomen, which proved to be a kidney. At cystoscopic examination a large catheter was inserted into this kidney for drainage. Twelve ounces of pus drained off during the night and the next morning she was operated upon. Through a trocar a quart of pus was evacuated, and after the organ was removed a good deal of pus still remained. The next week we had a similar case on the ward, and, if time would permit, many more similar cases could be enumerated.

From my experience in urology, which is so closely associated at times with obstetrics and gynæcology, I believe that uterine pressure bears but little if any relation to renal infection. On the other hand, I am a firm believer in the lymphatics as the most frequent avenue of ascending infection, and that the severity and duration of the condition is dependent upon the urinary outflow. Any condition which tends to obstruct the stream causes more or less stasis. MacCallum, of Johns Hopkins University, says that "In all forms of obstruction to the outflow of a secretion, we have traced the liability of the tissues to infection and the kidney is no exception to this rule."

TREATMENT

In conclusion, I would say that so far as treatment of the simple cases of pyelitis is concerned large doses of alkalies with urinary antiseptics are indicated. In colon infections with acid urine the former should be pushed until the urine is strongly alkaline. Helmitol is probably preferable as an antiseptic then. In my experience, the new and expensive urinary antiseptics are little, if any, more efficient than the cheaper ones. They are certainly not worth the price one has to pay. If these cases do not readily clear up, and particularly if the patients are running a temperature of 101° or more, no time should be lost in catheterizing the ureters and draining the

kidney, as otherwise extensive damage may readily ensue. Ureteral catheterization is much less likely to cause a miscarriage than a high temperature. Furthermore, if I am correct when I state that the majority of the severe pyelonephritis cases are caused from some urological lesion, then as soon as the condition of the patient permits, a search should be made for the cause, which, if found, should be corrected. During pregnancy, however, is no time for a prolonged and thorough investigation.

It might be said that I have not dwelt enough on treatment. My answer is that the simple cases will all clear up with the usual medication, while the severe forms need more than medicine. The latter need investigation. If they do not get it early enough to correct the condition the patients concerned will find themselves in some surgical service later on and probably minus a kidney as a result of the delay.

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LEAD POISONING IN BRASS AND BRONZE FOUNDRIES*

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IN 1928 one of us[1] drew attention to the fact that lead poisoning in certain types of bronze foundries is an important hazard. This fact had apparently been overlooked, for a search of the medical literature had failed to reveal any reference to the subject. Since the publication of this article cases of lead poisoning have been steadily coming to our attention, particularly from foundries making so-called "railroad bronze". Our interest in this subject has been constantly stimulated, and the foundry owners, at first incredulous, have begun to take steps to improve the state of affairs. In addition to bronze workers, however, we have seen a few cases of lead poisoning in brass moulders and polishers, and we have also had the opportunity of examining blood smears of men working in a brass and bronze foundry, where the lead content of the alloy was relatively low.

Although the literature on the diseases of bronze workers is meagre, that on brass workers is quite large. For the most part it refers to the so-called "brass shakes"; but some references have been found to lead poisoning. An early reference is that of M. P. dePietra.[2] Working in France, he maintained "close and continuous contact with 12 copper polishers in a small workshop over a long period". Among his conclusions he stated that "Copper colic, as described by the writers of the 18th and 19th centuries, does not exist." Simon[3] said: "All brass workers, except dippers and laquerers, are subject to colic, constipation and various other disturbances of the gastro-intestinal system". "The blue line," he said, "is not seen". Suckling[4] reported the cases of two brass workers; one suffered from double wrist drop with marked loss of muscular sense in the legs, and there was a green line on the teeth; the other, a brass finisher, had weakness of grasp and foot drop. Both improved on the administration of potassium iodide. Murray[5] described anæmia, anorexia, and epigastric pains occurring in persons filing and polishing brass. This author mentions the fact that lead poisoning has been reported in Birmingham among brass workers, but does

* Presented at the third session of the Section of Industrial Hygiene, Annual Meeting of the American Public Health Association, October 4, 1929.

not believe that the adulteration of brass with lead is common enough to account for all the cases. Treatment with phosphoric acid is said to be specific. This article called forth a note in the *British Medical Journal* from Poole,[6] recalling one patient, "in whom the nerve changes had apparently behaved in a similar manner to that where the intestine is locally affected in lead colic".

In 1901 Murray[7] described a form of chronic brass poisoning showing anæmia, weakness, headache, muscular pains, impairment of digestion, weakness and tremor of the tongue and hands. Sicard[8] stated in reference to brass workers, "The gastro-intestinal effects are seen more particularly in filers and polishers who transfer dust and filings to their mouths. Copper plays a great factor, as do lead and arsenic in materials of poor quality." Roberts[9] describes what he calls a case of chronic copper poisoning in a boy of 20 engaged in grinding brass. The symptoms were loss of appetite and power, slight jaundice and progress emaciation, colicky pain and obstinate constipation. There was a green line on the gums. It might be stated at this point that the green line of copper workers is characteristically on the teeth, not on the gums, and that often the hair and underwear is stained green. Neither of these phenomena is an evidence of copper absorption or poisoning. Hayhurst[10] states that constipation is the rule among brass workers, and that anæmia and emaciation have long been cited as being characteristic of older brass moulders. He asserts that in nearly all the brass foundries visited in Illinois from 0.5 to 7 per cent of lead was contained in the alloy. Moerl,[11] in describing the precautions taken to safeguard health at the Pullman Works, mentions that the brass workers were examined each month for plumbism. Legge[12] in an examination of 233 brass casters and 210 brass polishers found a blue line on the gums of 4 casters and 16 polishers. In commenting on a study of brass workers Alice Hamilton[13] states that "inquiry showed that several cases that were reported as brass poisoning were really lead poisoning", and Kober[14] asserts that in England a number of cases of plumbism are annually reported among the polishers and buffers of brass goods, especially spigots.

It is evident from this cursory review of the literature that the symptoms associated with so-called brass or copper poisoning are closely allied to our conception of lead poisoning. From the fact that men working in dust containing copper only do not appear to be adversely affected it is reasonable to question the fact of chronic poisoning. Alice Hamilton[15] believes that it is possible, for the most part, to trace to some known toxic agent, usually lead, the symptoms which have been attributed to copper. The question of chronic zinc poisoning is not by any means so clear. We do not intend to go into the matter of the toxicity of zinc in this paper, but we do wish to point out the fact that lead is commonly associated with copper, tin and zinc in the process of founding, and it is to be reckoned as an important hazard in these trades.

We have examined 38 men engaged in the manufacture of railroad bronze. Some of these men were referred to us because they were sick; others came to the hospital on account of accidental injuries. Of these 38 men 24 were cases of active lead poisoning. Nine were cases of lead absorption without symptoms, and 5 showed no symptoms of plumbism. The men who were sick showed the characteristic symptoms of colic and constipation and the objective signs of blue line, stippling of the red cells, and lead in the urine. One man had a double wrist drop.

We also examined 3 brass polishers, each having relieved the other at the same emery wheel. All of these men were poisoned by lead. In addition we examined the blood smears of 26 men working in another brass and bronze foundry where the percentage of lead in the alloy was below 6 per cent. Three of these men showed many stippled red blood cells, recorded as 3 plus. Two showed numerous stippled cells, recorded as 2 plus; 2 showed occasional stippled cells; and the rest were negative. One of the 3 plus men afterwards became a clinical case of lead poisoning.

Bronze is essentially an alloy of copper and tin. Brass is an alloy of copper and zinc; but this distinction is not always observed, and sometimes the alloys with a high zinc content are referred to as bronzes, and alloys with a high tin content as brasses. The distinction is rather academic, however, since the procedure in the founding of either brass or bronze is essentially the same. Lead is frequently incorporated in the alloy, sometimes to improve it, sometimes to cheapen it. In railroad bronzes, for bearings and the like, the antifrictional qualities of lead make it a valuable

constituent, and it is frequently present in amounts as high as 20 per cent.[16, 17]

The melting point of lead is about 328° C.; that of copper 1100° C. We[1] have determined the volatilization of lead at this temperature and find that it is in the neighbourhood of 0.02 grams per square inch per minute. Lead vapour, when given off from a very hot surface, quickly cools. Some of it may remain as metallic lead and some may be converted into lead oxide. Brown[18] has shown by means of micro-photographs that lead fumes of this type are characteristically fine, the individual particles being often less than one micron in diameter. It is reasonable to suppose, therefore, that the fine particles stay in suspension for some minutes at least after they have been given off from the crucible.

In the foundry the metals are alloyed in furnaces heated usually with oil or electricity. When the various metals have been thoroughly mixed in the furnace the alloy is poured into a crucible and transported by overhead trolleys to the moulds, where it is skimmed and poured. It is in the process of pouring, while the molten metal is bright and free from slag, that the greatest volatilization of lead or zinc is to be anticipated.

At the request of one of the foundries we collected samples of air at various places and examined them for lead. The apparatus used was a Buchner funnel filled with cotton wool and connected to a suction fan. The quantity of air filtered was measured by an orifice meter calibrated with an ordinary gas meter. This device was found to be efficient for zinc fume, and it was assumed that lead fume would be similar. The samples were collected on two days. On the first day samples of one or two cubic metres were collected at various places; on the second day the collector ran in one place for more than five hours, filtering about 17½ cubic metres of air.

The technique usually adopted in the analysis of air for lead is based on the precipitation of lead by hydrogen sulphide. In the presence of copper and iron and zinc this method is quite inaccurate, since all these metals are precipitated by hydrogen sulphide. Instead of hydrogen sulphide we used the sulphate method. We are indebted to Dr. F. B. Flinn, of Columbia University, for the technical details. Prior to making the actual analysis we carried through determinations of known quantities of lead with iron, copper and zinc, and determined that the method was quite reliable. The method is as follows:

> The cotton wool in which the fume has been collected is incinerated over night in an electric muffle furnace at a dull black heat. To the residue are added 10 or 12 c.c. of 50 per cent nitric acid and this is allowed to digest for an hour. The acid solution is then filtered and washed through the filter with distilled water. Then 10 c.c. of concentrated sulphuric acid are added. The mixture of nitric and sulphuric acids is gently boiled in a pyrex evaporating dish, covered with a watch glass, until all the nitric acid has been driven off. A fine white precipitate of lead sulphate appears at this time if lead is present. This is washed three or four times with dilute sulphuric acid in the centrifuge and finally with absolute alcohol. To the small precipitate in the bottom of the centrifuge 5 or 6 c.c. of ammonium acetate are added, and the solution allowed to dissolve in a water bath for about an hour. This solution of lead is then treated with 1 c.c. of saturated potassium chromate solution. The precipitated lead chromate is filtered, washed and dissolved in dilute hydrochloric acid; 2 or 3 c.c. of 30 per cent potassium iodide solution are added, and the free iodide titrated with standard sodium thio-sulphate, using starch as an indicator.

The results of our analyses are given in the accompanying table.

LEAD IN FOUNDRY AIR

Time	*Particulars*	*Amount of air collected*	*Milligrams of lead per cubic metre of air*
1.25 to 1.45	In foundry pouring engine metal (14-15% lead). Plant had been shut down for lunch. No pots had been poured for 1½ hours	30 cu. ft.	0.00
1.56 to 2.16	In foundry pouring steam metal (6% lead)	34 cu. ft.	0.08 mg.
2.38 to 2.58	In furnace room, near furnace melting engine metal (14-15% lead)	34 cu. ft.	1.00 mg.
3.09 to 3.49	In foundry pouring engine metal (14-15% lead)	64 cu. ft.	0.568 mg.
Collector ran 5 hrs., 10 mins.	In foundry, 14 pots (14-18% lead), 4 pots yellow brass (no lead)	612 cu. ft.	0.865 mg.

The question as to what is the dangerous concentration of lead fume in the air has not been definitely settled. Legge[19] has estimated that with a concentration of 0.5 milligrams of lead per cubic metre of air men will rarely develop colic and never encephalopathy. Telesky[19] believes that a daily dose of a little more than one milligram of lead over a period of several months will cause plumbism. Recent studies, however, have shown that men may be exposed to relatively enormous amounts of lead and survive. For example, McNair and Price[20] have found in wire brushing painted surfaces as high a concentration as 18.4 milligrams of lead per cubic metre of air. Our determinations rather support Legge's statement as to the dangerous concentration of lead in the air. That is to say, in this foundry, where many cases of lead poisoning were occurring, the concentration of lead was about double the safe amount, as estimated by Legge. There is a point in this connection which is perhaps of very considerable importance, namely, the effect of continuous exposure to small quantities of lead. Although we have no proof, it is our impression that small quantities of lead, insufficient to produce toxic conditions, may result after years of exposure in deterioration, particularly of the cardiovascular and renal systems. It is also possible that men who prove resistant to the acute toxic effects of lead, and work in an environment where others become sick, may be themselves worse off in the long run than their fellows. For those who are susceptible to acute lead poisoning are apt to leave the trade in which they are exposed, whereas those who are not may be exposed for years to the action of the metal. We see from time to time men of this type who have carried on for ten to fifteen years in an environment where others were being poisoned. Two or three such men have been treated by us recently. All showed very definite evidence of vascular changes, especially in the kidney.

It is our belief that few cases of lead poisoning are to be expected in the founding of alloys containing less than 6 per cent of lead. The danger of slow deterioration of the employees must not be ignored, however, in this type of practice. In the chipping and polishing of low lead alloys, on the other hand, the danger of plumbism is probably very considerable. As stated above, we have seen three men who succeeded each other on the same emery wheel come down with lead poisoning.

We subscribe to the view that in lead poisoning the greatest part of the lead is absorbed through the lungs. To prevent this in foundries the lead may be kept from the men by means of masks, may be removed at its source by local exhausts, or may be diluted to a safe concentration by special ventilation. The last-named method is undoubtedly the most expensive, for it involves an elaborate system of inlet and exhaust piping, and the heating of large volumes of outside air. Where only a small part of the product contains lead it probably can be handled by segregating the lead alloys in a well ventilated room. From six to ten changes of air per hour should be made in rooms where high lead brass and bronze are being cast.

The wearing of masks is not recommended as a solution of the problem. Masks are often broken reeds to lean upon, and it does not seem reasonable to ask men to wear respirators all day long at their work. Probably the best and cheapest method of handling the problem is to provide multiple exhaust hoods throughout the foundry. These hoods should be connected to a common manifold, and should be arranged in such a way that they can be lowered over the moulds during the process of pouring, and raised out of the way when not in use. For the sake of economy and efficiency an automatic arrangement should be provided whereby the individual exhaust duct is shut off from the suction when not in use. The furnace should be equipped with exhaust hoods. On theoretical grounds, it would seem that the volatilization of lead from the slag covered metal of the furnaces is not high, but our solitary observation in the furnace room seems to indicate that there is a lead hazard there.

In the polishing process it is comparatively easy by means of local exhausts attached to the polishing wheels to remove the dangerous dust at its source.

Since some individuals are more susceptible to lead poisoning than others we believe that men who are exposed to the risk of plumbism should be under competent medical supervision, and should be examined twice a month, both in a general way and by means of blood smears. Adequate washing facilities and eating facilities should also be provided.

SUMMARY

Thirty-eight men engaged in the founding of high lead bronze were sent to the Montreal General Hospital for various complaints. Twenty-four of these were found to be suffering from acute lead poisoning, 9 others showed definite evidence of lead absorption, and only 5 showed no signs of plumbism.

Three brass polishers who succeeded each other on the same emery wheel became poisoned with lead.

Blood smears of twenty-six men engaged in the polishing of low lead brass and bronze (less than 6 per cent) were examined. Five of these showed stippled cells, well in excess of 200 per million red cells.

The analysis of air in one foundry showed the concentration of lead in the air to be about 0.85 milligrams per cubic metre.

Our review of the literature of chronic brass poisoning indicates that many cases of chronic disability occur among founders and polishers of brass, and that the symptoms recorded are closely allied to those of lead poisoning.

It is our belief that lead plays an important part in the disease picture variously diagnosed as brass poisoning, bronze poisoning, and copper poisoning.

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SOME REMARKS ON CHRONIC SUPPURATIVE OTITIS MEDIA ITS PREVENTION AND TREATMENT

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IN the discussion of this subject before the American Otological Society at Swampscott six years ago[1] a considerable number of those present said they had seen no benefit from the removal of tonsils and adenoids in chronic middle ear suppuration. This was entirely contrary to my experience and to that of my hospital associates at that time, and it still is. I do not mean to imply that the removal of infected tonsils and adenoids will supplant all other treatment, but experience certainly convinces me that both surgical and non-surgical treatment are more often successful when infected tonsils and adenoids have been removed than when they have not been. Certainly, in the *prevention* of chronic middle ear suppuration the removal of infected tonsils and adenoids plays an important part. The timely removal of them in cases that show a tendency to recurrent middle ear infection, early myringotomy in cases that have developed acute middle ear abscess and prompt exenteration of the mastoid at the first sign of a widening perforation in the drum membrane are, in my opinion, three safeguards for the prevention of chronic suppurative otitis media that are worthy of the attention of the pædiatrician and general practitioner as well as the otologist, and I feel that no small responsibility is assumed when the early adoption of these measures is opposed. At the Manhattan Eye, Ear and Throat Hospital where a large number of tonsil and adenoid operations are performed and these procedures are more generally followed now than formerly the results clearly show their value. In 1907, in a total number of 1622 cases of middle ear suppuration, there were 410 more chronic than acute cases. In 1925, in a total number of 6,420 cases, there were 1,500 more acute than chronic cases. This reversal is fairly attributable to the preventive measures mentioned.

[1] Read at the annual meeting of the Ontario Medical Association, Toronto, May, 1930.

Where acute signs of mastoiditis have subsided but discharge continues through a pouting or widening perforation, we believe that exenteration of the mastoid is strongly indicated to prevent deafness and chronic otorrhea. A considerable percentage of these cases develop into chronic otorrhea or something worse if operation is unduly delayed, and practically all of the patients can be cured and their hearing preserved by timely simple mastoidectomy.

In our clinic, the removal of infected tonsils and adenoids is advised with all treatment, both surgical and non-surgical, for in my experience, even when they are inconspicuous, their removal has been of decided benefit in the majority of cases. The operation offers an excellent opportunity for performing on selected cases the Yankauer operation[3] for closure of the Eustachian tube. Little is heard nowadays of this operation. It may well be tried in cases where the hearing is poor and there is little evidence of serious involvement in the attic or mastoid with fair chance of its rendering further operation unnecessary. Where the hearing is good, closure of the tube is not advisable except when safety to the patient indicates it as a part of the radical mastoid operation.

Ossiculectomy still has strong advocates, though few of them remain in New York City. Its status there is well expressed by Kerrison who says, "The indications for this operation cannot be reduced to exact statement. There is no possible means of determining definitely, in any case of chronic middle ear suppuration of long standing, that areas of necrosis or foci of infection do not exist in regions beyond the reach of surgical measures confined to the tympanic vault. The value of ossiculectomy must, therefore, depend very largely upon the experience and judgment of the individual surgeon."

Operation through the mastoid often reveals the most unexpected involvement of the bone, and ossiculectomy performed with exenteration of the mastoid seems to me a far safer procedure than when it is performed through the canal. I think the danger of exciting an exacerbation of latent involvement in the mastoid through a narrow approach has been the reason why intratympanic surgery through the canal is no longer so generally practised as it was formerly. I called attention to the fact six years ago that only one ossiculectomy had been performed at the Manhattan Eye, Ear and Throat Hospital in ten years, and none in that period had been performed at the New York Eye and Ear Infirmary. Aside from the danger of stirring up infection in the attic and antrum through a narrow approach, the operation, while regarded as a conservative one, seems to me the reverse when compared with the modified radical operation which really conserves what the ossiculectomy takes away. Bondy's term "conservative mastoid" for the modified radical operation is amply justified.

Dr. George L. Richards,[4] quoting Bondy some years ago, said the indications for his operation are "hearing distance before the operation of two metres or more provided that it is probable that there is a continuity of the ossicular chain and that the middle ear cavity is itself not diseased, or but slightly. It is especially indicated where the perforation is limited to Shrapnell's membrane, the drum membrane intact and hearing good." These are ideal indications, but *provided danger to the patient can be eliminated*, the conservative operation may be tried in many types of cases where the hearing is good, and time be allowed for regeneration of the tympanum.

The question when to operate on subacute cases cannot be answered by stating a time based on the duration of the infection. The appearance of the fundus, and the character and amount of the discharge are of more importance in reaching a decision than the duration of the disease. Whether in the first week or the sixth, a widening perforation in the drum membrane can better be stopped by operation on the mastoid than in any other way. Nor does the duration of the infection, beyond a few weeks, indicate the type of operation to be performed for its relief, for the reason that the degree of destruction depends on the character of the infection, the individual's resistance to it, and the individual anatomy of the part, rather than on the duration of the disease. The extent of the involvement found on opening the mastoid should determine the type of operation to be employed. This opinion is not held by those who resort to but two operations for otorrhœa, the simple mastoidectomy and the radical, believing that when extensive exenteration of the mastoid

fails anything short of the radical is a waste of time.

That the attic can be well exposed in the modified radical operation and, in exceptional cases, cholesteatoma removed from it without recurrence has been amply testified to by Blackwell, Bondy, Morley Smith, myself and others, but when because of extensive tympanic involvement the old radical operation is definitely indicated, let it be performed not as a Stacke but with *complete exenteration of the mastoid and removal of the tip* and with special widening of the tympanum to facilitate after-treatment.

Decision is difficult in the type that is generally regarded as not dangerous with a more or less central perforation and an intermittent mucopurulent discharge. If the hearing is good, it is likely to be sacrificed by getting a dry tympanum, and what is best to do depends very largely upon the experience and judgment of the individual surgeon. Where the hearing is good, but there is evidence of latent mastoid involvement, complete exenteration of the mastoid with especial attention to the attic region through a widened aditus seems to me the safest procedure in experienced hands.

The simple mastoid operation may be employed successfully in many of these cases, but when ventilation of the attic and a view of the ossicles are worth while in the after treatment they can only be obtained in the modified radical operation. The objection raised that the dermatized cavity in the mastoid that follows both the radical and modified radical operation is a source of trouble ever afterwards is due to operations that have been performed with little or no thought of avoiding this condition. Rapid dermatization of these cavities is often promoted when rapid dermatization after the radical operation is desirable only in the tympanic part of the cavity. It should be discouraged in the mastoid portion in the after-treatment of both operations in order that time may be allowed for healthy granulations to fill and lessen the size of the mastoid cavity. More important still in avoiding a large posterior cavity in the mastoid is the complete removal of the tip and ledge along the digastric muscle and lowering of the posterior canal wall to its limit to allow the neck muscles to fill in and obliterate this region. The mastoid cavity can also be flattened by sloping its margins so as to allow the soft parts when the wound is closed to lie close to the inner plate. Small "self cleaning" cavities can be obtained in this way in most of the cases.

Because of the tendency of some radicals to accumulate detritus, Dr. Morrisett Smith of New York has recently devised a new operation as a substitute for the radical which can be used, he thinks, in about three-fourths of the cases in which that operation is usually performed. The advantage claimed, in addition to the one mentioned, of avoiding a dermatized cavity in the mastoid is that the hearing is better preserved through more rapid dermatization of the inner tympanic wall. He first performs a simple mastoid operation and removes the ossicles through the aditus, leaving the posterior bony wall intact. After a thorough mastoidectomy, the membranous canal is separated from the posterior canal wall and displaced forward while the tympanum is curetted through the canal. The membranous canal is then replaced and held by vaseline packing. The posterior wound is dressed as a simple mastoid, and the tympanum is cared for through the auditory canal.

The excellent results he has been able to show I feel are due to particular care and attention in the after-treatment which is even more necessary in this operation than in the more open and accessible radical operation in which diseased tissue is more easily recognized and removed. Some of the factors regarded as essential for the best results in the old operation cannot be performed through the canal, and results seem to show that this more elaborate attention to the tympanum is not necessary, at least in the cases selected for the new operation. While interested in this new procedure, I feel there would be less indication for it were certain details in the technique of the radical and modified radical more generally followed, especially those mentioned which I find produce, in a majority of cases, a self-cleaning cavity. In the preservation of hearing, where the ossicles have been removed it would seem that the more accessible the tympanum is for after treatment the better opportunity there is to obtain a thin covering on its inner wall, a point in favour of the more open operation.

I am sensible of the fact that I have made little mention of non-surgical treatment. It is through no lack of interest. In non-surgical treatment, opinion will be divided on what should constitute a fair trial of it before surgical treatment is resorted to. None who finds success with some form of it at first trial will fail in later cases to give it longer trial than one who fails with it in his first case and succeeds only by operating. It is sometimes difficult to determine whether the treatment has been properly carried out, and in dispensary practice, especially in children, it is often necessary to admit them to the hospital for more regular treatment and observation.

I have not been impressed with the results I have seen from the use of vaccines in chronic suppurative otitis media, and I have had no experience with zinc ionization.

In conclusion, let me emphasize not only the scientific but the medico-legal importance of recording in all cases the condition of the static and auditory labyrinths before any treatment is begun. Failure to use a noise apparatus both before and after operation may prove embarrassing, for the attention of the patient is sometimes not called to the total loss of hearing in an ear until it has been operated on.

The study of cases leads to their careful selection for different kinds of treatment and to the adoption of different methods for different types, not to any one treatment for all.

A frank expression of views based on clinical experience is said to be of value. This is true provided the trend of the experience and the personal equation is understood and sometimes discounted. In this instance, the trend has been surgical, radically so for the *prevention* of chronic suppurative otitis media, and, as far as possible, conservatively surgical in the treatment of the disease itself.

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EXOPHORIA AND ESOPHORIA

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PRACTITIONERS in other branches of medicine do not give a prescription to a patient and expect that the damage of years of abuse and neglect will be completely eliminated. Nor may ophthalmologists overcome with an order for glasses the harm done by disregard of the elementary principles of hygiene and preventive medicine. Our patients then are going to be comfortable, relieved, or uncomfortable. I think that a patient should know what to expect. Prognosis depends on many factors, and I will discuss only one important consideration, and that is the horizontal muscle balance of the eyes.

Horizontal ocular muscle imbalance is known as exophoria when there is a tendency of the eyes to deviate outwards, and as esophoria when the deviation is inwards. It results from: (1) refractive errors; (2) deficient or excessive convergence or divergence, due to nerve, muscle, congenital or mechanical anomalies. Actual "tropias" and paralytic strabismus have a similar classification, but the "phorias" are merely a tendency to strabismus, and are of the concomitant type, either homonymous or heteronymous.

In the tropias and the paralytic types the lesion is so severe that fusion cannot be maintained. With the phorias the fusion sense is well developed and diplopia is rare. Asthenopia develops as a result of the faulty over- or under-action of the muscles to maintain the fusion necessary for binocular single vision and the higher degree of stereoscopic vision. The subjective symptoms are: discomfort, a feeling of tension and headache, gradually increasing with the use of the eyes during the day.

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Morning symptoms may result from gross abuse of the eyes during the previous day, usually at the vertex or occipital region; injection of the conjunctiva or lids, and a feeling of fullness behind the eyes are accompanying signs and symptoms.

Exophoria

This is probably the most important cause of ocular discomfort, especially in near workers, and deserves our attention on account of the marked disability it may produce. The patient who is motivated by the necessity of earning a living starts prolonged near work with distaste for it, as he knows what is going to happen.

The symptoms are as follows. A feeling of fullness of the lids and a tense uncomfortable contracture of all the eye muscles and the muscles of the upper part of the face gradually develop. A dull pain about the back of the eyes and over the brow makes its appearance, proportional to the duration of the near work and the degree of exophoria. Slowly a state of spasm of the muscles about the orbit ensues, accompanied by occasional convulsive contractures of the orbicularis and muscles of the upper part of the face. Clonic spasms of one orbicularis muscle, or a unilateral tic of the facial muscles may occur.

At this stage it may be noted that the conjunctivæ are congested and the lids somewhat œdematous. The patient says that his eyes feel "strained"; that he is tired of work, sleepy, or that he cannot concentrate. Should it be necessary for him to continue, headache comes on, at first frontal, or it may be located deep in the orbit. The headache gradually includes the vertex and occipital areas, and frequently tender areas develop, which, when touched, give the sensation of actual pain. Prolonged use of the eyes under these conditions gives a headache that is protracted over the following day, as a dull type, which in turn is aggravated by near work or makes it impossible. The person with exophoria dreads near work; at school he does poorly in his studies; in later life, in his profession, if much reading is required. The disability resulting from exophoria may influence the choice of one's occupation, or, when it develops later in life, force a change.

Two other types of headache may be mentioned:

Summation headache: In the presence of a debilitating condition, such as influenza, or a chronic disease, such as tuberculosis, much lighter efforts at near work may bring on a severe headache, due to the multiple factors acting in a vicious cycle.

Transportation headache: Patients with exophoria suffer discomfort on trains and other moving vehicles. A down-town shopping trip may bring it on, while prolonged train travel may aggravate the symptoms to nausea, dizziness and even vomiting. Motor drivers become sleepy if forced to travel considerable distances, and their attention may become so distracted that they are potential dangers in traffic, both to themselves and to others. Aviators with exophoria make poor landings, owing to the tendency to heteronymous diplopia—they try to land on a level above the ground, as the surface is projected to a higher, or closer, position to the machine than it really occupies.

Esophoria

Patients with esophoria are relatively more comfortable for near work than for distance, as they have by the nature of their condition a tendency to convergence. They are frequently of the refractive type, almost always hypermetropes, and find great comfort with convex lenses for near work. At games they are usually poor, they misjudge distances, and suffer headache from attendance at movies, or while travelling in a moving vehicle. Their symptoms are the result of the use of the eyes for distance rather than for near work. Aviators with esophoria tend to project the surface of the ground for landing as being farther away than it really is. This is caused by the tendency to homonymous diplopia, as they try to judge the distance to the ground.

Measurement

The extent of conjugate deviation, right and left, and the degree of convergence should be noted. The red glass over one eye should be used to bring out any tendency to diplopia. After careful refraction, the degree of horizontal muscle imbalance is measured with a Maddox rod for distance, while the glass correction is being worn. The amount of prism required to

superimpose the images that cannot be fused owing to their dissimilarity is then noted. Exophoria is measured by the amount of prism base *in* (to the nose) required to overcome the heteronymous deviation of the two images as seen by the right and left eyes; esophoria by the amount of prism base *out* that is required to overcome the homonymous separation of the images.

For the near measurement the Graefe's test card is used when vision with each eye is good; otherwise the Maddox rod and a light at 14 inches is used. For Graefe's test a prism of six dioptres is placed base up over the right eye. The deviation of the lower arrow seen by the right eye, when it passes to the left, indicates the amount of exophoria; when to the right, the amount of esophoria; the red and black number enables the patient to distinguish the exact amount. For this test the near addition is worn by presbyopes. The dynamic ability of the muscles to overcome prism base in and base out is next recorded for distance. The normal minimum is 9 to 13 base out and 3 to 4 base in. These measurements represent the ability of the muscles to converge or diverge the eyes while the fusion is still able to maintain binocular single vision. They give the examiner some knowledge of the ability of the eyes to perform prolonged work.

TREATMENT

If exophoria is present the hypermetrope and the presbyope must be under-corrected, the myope more fully corrected. If esophoria is present the hypermetrope and the presbyope must be more fully corrected while the myope should be less fully corrected.

Prisms, either added to the glass by grinding or by decentring the lens, may give immediate comfort, but later it will be found necessary to increase the amount of prism. Strong prisms produce marked aberrations in the images, so that the end-result is more hopeless. I believe that careful refraction and centring of the glasses is of the greatest importance. Optical centres for exophoria should be adjusted for near pupillary distance rather than for distant if asthenopic symptoms are present for reading.

Muscle exercises for those suffering from exophoria are beneficial, the more so the younger the patient. This really is muscle training, and so should not be overdone at any one time, must be continued over a long period, and the general condition should be carefully investigated and attended to, with whatever treatment is indicated.

Near reading and bar reading and converging exercises are excellent if faithfully carried out over a long period of time. Careful instructions must be given. These different methods of muscle training should be alternated to maintain the patient's interest.

Operative treatment is advisable for the higher degrees when it can be clearly demonstrated that there is present a fair amount of convergence when it is proposed to tenotomize an external rectus muscle. Similarly, there should be ability of the eyes to overcome prism base in when it is proposed to do a tendon lengthening or tenotomy of an internal rectus muscle.

EXPERIMENTAL PRODUCTION OF SCARLET FEVER.—T. Toyoda, Y. Futagi, and M. Okamoto claim to have produced scarlet fever by throat inoculation with pure cultures of hæmolytic streptococci. Two strains were used, both isolated from the throats of scarlet fever patients; at the time of inoculation they were in the third and fourth generation cultures respectively. The organisms were grown for twenty hours on an agar slope and in dextrose broth; a suspension was made; a sterile cotton swab was dipped in the suspension, and then rubbed over the throat. Three boys, apparently between the ages of 3 and 7 years, were used as volunteers; they were all Dick-positive. The time of the experiment was early winter. There had been no contact with scarlet fever for a long time. The three subjects reacted positively; the temperature rose on the second or third day after inoculation, and a rash came out on the third or fourth day, persisting for two or three days. The throat was hyperæmic and the tonsils slightly enlarged; in two of the subjects desquamation subsequently occurred. In each case the Schultz-Charlton reaction was positive, and after the attack the patient's serum became capable of producing a positive Schultz-Charlton reaction, though before inoculation the serum had been negative. Five subjects inoculated in the summer with an old strain of hæmolytic streptococcus, of comparatively low virulence to mice, failed to react. Moreover, children inoculated, apparently during the winter, with filtrates of freshly isolated strains, likewise failed to react. The authors conclude that scarlet fever is caused by the hæmolytic streptococcus itself, and not by any filterable body attached to it.—*J. Infect. Dis.*, April, 1931, p. 350.

OXYGEN IN THE TREATMENT OF TUBERCULOSIS*

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IN 1908[1] Bainbridge reviewed the literature relating to various therapeutic uses of oxygen; he reported cases in this and in subsequent papers. In 1921 Rost[7] reported on the treatment of tuberculosis of enclosed cavities by the injection of oxygen. Since then several observers[8, 9] have reported cases in which this method of treatment was used. I wish to present two cases of tuberculous peritonitis in which oxygen was introduced into the peritoneal space, and also to record the apparently beneficial results from the use of oxygen administered subcutaneously in cases of pulmonary tuberculosis.

CASE 1

A girl, aged two and a half years, was admitted to hospital October 29, 1928. The mother stated that a physician had been consulted three weeks previously because the child did not seem well, although she had not manifested any specific complaint. Examination did not reveal a cause for her symptoms. She had, however, a bilateral inguinal hernia for which operation was advised. A week later symptoms were more marked; the child had lost her appetite, and the mother thought the abdomen was slightly distended. The patient lost weight rapidly. On a few occasions she vomited and for three days had three or four watery stools in each twenty-four hours. During the week previous to admission to hospital she voided frequently and in very small amounts.

On examination the child looked sick. She was pale and thin, but not emaciated. The tongue was slightly coated; the tonsils were enlarged and somewhat inflamed. A few small discrete glands could be palpated in the neck. The heart and lungs appeared to be normal. From the xiphoid cartilage to the symphysis pubis the abdomen was evenly and tremendously distended, with tense glistening skin, and dilated overfilled veins. The percussion note was flat throughout and a fluid wave could be felt. She voided every fifteen to thirty minutes, but urinalysis, including microscopic examination of the urine, was negative. The temperature was 99.8° F. and the leukocytes numbered 16,400. The whole picture was one of a fairly rapidly progressive disease. A diagnosis of tuberculous peritonitis with ascites was made.

Exploratory laparotomy was performed. Immediately on incision of the parietal peritoneum, there was a gush of thin straw-coloured fluid. The peritoneum was œdematous and thick, and on both its visceral and parietal layers were multiple small hæmorrhagic areas measuring 1 to 2 mm. in diameter. The omentum was shrunken and small nodules were found throughout its whole extent. There were a few fine adhesions. The appendix did not appear to be the origin of the infection, and owing to the child's condition it was not removed. After evacuation of the fluid the abdomen was closed in layers in the usual manner. Immediately after the operation, which required only a few minutes, the condition of the patient was poor, but she responded well to stimulants, including coffee given rectally and saline given subcutaneously. In spite of supportive measures, the course was stormy. The abdomen soon filled with fluid and it was necessary to perform paracentesis on seven occasions between November 7th, eight days after operation, and January 12th. On one occasion as much as 2,160 c.c. of straw-coloured fluid was removed. The method which seemed safest was to make a small incision in the skin through which a pointed hæmostat was carried through the abdominal wall. Continuous drainage by tubes was attempted, but, as was anticipated, these rapidly closed off.

The child became worse gradually, and as a fatal outcome seemed inevitable I decided to try oxygen intraperitoneally. The abdomen was drained in the manner described. A catheter was passed through the opening into the abdominal cavity and a purse-string suture was put in place around it. From a tank of commercial oxygen, fitted with a double valve pressure system, gas was liberated slowly into the cavity, until it was distended to approximately half its size before drainage. As the catheter was removed, the opening was closed by the purse-string suture. After the first treatment the only change noted was that fluid collected more rapidly than before; 2,000 c.c. was removed on the sixth day, when oxygen was again introduced. Eight days later, paracentesis was necessary; this was followed by the introduction of oxygen. Fourteen days later only 900 c.c. of fluid was withdrawn, and oxygen was introduced for the fourth and last time. After this, fluid did not accumulate. After the second introduction of oxygen there was slight but obvious improvement in the child's general condition, and from that time she made a rapid and complete recovery. She was under observation during the remainder of the winter, and was dismissed in the spring, about six months after the first admission.

CASE 2

A girl, aged sixteen years, was admitted to hospital January 26, 1929, with the symptoms and signs of acute appendicitis. She had had two previous acute attacks, and had not regained complete health in the interval. Productive cough and intermittent pain in the thorax had been present for six months. Repeated examination of the sputum for the bacillus of tuberculosis was negative, but the history, roentgenograms and clinical observations indicated tuberculosis of the upper lobe of the right lung. The abdominal condition required surgical interference.

Laparotomy was performed under local infiltration anæsthesia. Diffuse, advanced tuberculosis of the appendix was found, with tuberculous peritonitis spreading radially from it, so that about half the abdominal contents were studded with well formed tubercles. Free fluid was absent and adhesions were few. The appendix was removed and the abdomen was closed.

* Work done while with the International Grenfell Association, St. Anthony, Newfoundland.

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Ten days after operation the patient was given oxygen intraperitoneally. A lumbar puncture needle was used for its introduction after a preliminary subcutaneous injection of morphine and local infiltration of the skin with procaine. This was repeated weekly for three weeks and was followed at intervals of a week by five injections of 1,000 to 1,200 c.c. of oxygen into the subcutaneous tissues of the axillæ. During this time the temperature, which had been slightly elevated, returned to normal, the cough and expectoration greatly lessened, and the abdominal tenderness disappeared. Improvement in the general condition and clinical symptoms was much more rapid than occurs after the use of general measures of treatment only. It was soon possible to consider the process as arrested.

Because of the rapid improvement in the pulmonary condition in Case 2, I determined to try oxygen administered subcutaneously to other patients suffering from pulmonary tuberculosis. Six patients were treated. In one patient diagnosis of pulmonary tuberculosis was made, but the bacillus of tuberculosis was not found in the sputum at any time. The organism was found in the sputum from each of the other five patients. Two of the six patients had had pulmonary hæmorrhages, but their condition was not hopeless. One patient had not improved for a long period. The other three patients were in a hopeless condition from the first, and the treatment was given as a placebo. The first three in this group of six patients appeared to be definitely benefited. The irregular temperature of one patient soon became normal. The disease was arrested more rapidly than would be ordinarily expected.

COMMENT

Rost reported on the treatment of tuberculous peritonitis, and tuberculosis of the joints, including Pott's disease with psoas abscess, by the introduction of oxygen into the enclosed cavities. He concluded that it was beneficial, and that the effect was brought about in one of three ways, mechanical only, therapeutic only, or mechanical and therapeutic. In tuberculous peritonitis he believed that the beneficial result was obtained by the third method. Hayes,[4] Purves and Bilcliffe,[6] Smith,[8] Stein[9] and others have used this type of treatment and reported beneficial results, although their conclusions vary somewhat. At the necropsy of patients who had died from pneumonia and who had been given oxygen subcutaneously before death, Kirk[5] noticed that the blood was bright red and arterial. He also pointed out that when a rabbit is given 150 c.c. of oxygen subcutaneously, blood taken from an ear vein after a few minutes is found to be arterial in character, and when shaken with air its colour cannot be heightened. Any benefit in pulmonary tuberculosis derived from oxygen administered subcutaneously must necessarily be due to its so-called therapeutic effect and not to its mechanical effect. The nature of this therapeutic effect is unknown, although it has been shown that some organisms will produce inhibitory substances retarding or preventing their growth when oxygen is present in excess. It is possible that the bacillus of tuberculosis produces some such substance when oxygen therapy is used, or it may be that the patient is benefited by the bringing about of a general tonic effect.

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INTRASPINAL MAGNESIUM SULPHATE FOR INTOLERABLE PAIN.—A. Gordon advocates intraspinal injections of magnesium sulphate for the relief of intolerable pain, and records satisfactory results in twelve cases (four of tabes, seven of radiculitis, and one of fibroblastoma of the cord). Based upon sound physiological deductions and experimentation, it is claimed that in certain cases of root pain, due to organic involvement of the central nervous system, relief can be obtained and existence rendered tolerable thereby. Success depends largely upon wise discrimination as to dosage, frequency, and length of intervals in treatment. The minimum adult dose is 2 c.cm. of a 25 per cent solution of magnesium sulphate, but in long-standing cases, when the patients are exhausted by pain and want of sleep, 4 c.cm. may be given. The spinal puncture should be below the second lumbar vertebra, preferably between the third and fourth or the fourth and fifth vertebræ. Immediately following the withdrawal of 5 c.cm. of spinal fluid, the solution should be introduced while the needle is in position; the patient is kept quiet in bed for several hours in a lateral position. Even in cases where a dry tap results, owing to blocking of the subarachnoid space, the injection should still be made. In one of the author's cases considerable relief was obtained though several dry punctures were made. In all the cases prior to the trial of the intraspinal method sedatives had failed to give any relief. One tabetic patient was completely relieved of severe lumbar pain and girdle sensation after three 2 c.cm. injections at weekly intervals, and the pain in the legs became better. There was also noticeable improvement in gait, ataxia, and bladder control.—*Med. J. & Rec.*, April 15, 1931, p. 399.

THE X-RAYS AS A COMPLEMENT TO ACTINOTHERAPY*

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VIII

IN the course of the Kelvin Lecture which he delivered in 1921, Sir William Bragg observed that clear indications are to hand that, dependent upon further research, there is a strong possibility of equilibrium, or health in the cell structure, being restored by means of x-ray treatment. As radiography should not be considered as an isolated entity in diagnosis but kept in correlation with other clinical methods of examination, there seems to be reasonable ground for assuming, especially with regard to the various forms of light therapy, that the x-ray can be used as a valuable adjuvant to, or in working partnership with, the rays of the spectrum not far removed from it. Bayliss says, speaking generally, "The effect of the x-rays on cells is similar to that of ultra-violet light. Their lethal effect, however, continues for a long period." In recent confirmation of this, Sampson says, "In lupus vulgaris, often after the first few actinic ray treatments, a dermatitis dose of x-rays is of the greatest utility. Of course, this treatment alone will clear up some cases, and so will the actinic ray, but together they will do much better work. And again, some of the worst looking cases of general psoriasis that we have ever had were sent in for treatment. Some of the more recent areas cleared up promptly under actinotherapy, but some of the older and more indurated regions were intractable until the ionising x-ray dose was added, when they cleared up also."

Before going farther, let us review in brief the nature of x-rays and their relation in the spectrum to ultra-violet rays. As a convenient definition of x-rays the following is submitted. X-rays are invisible rays emitted by an electrically excited Crooke's tube, which rays are capable of penetrating many substances opaque to light, and of producing actinic or fluorescent effects. In terms of wave length—

X-rays	— 282 Å
Ultra-violet	— 360 Å to 4000 Å
Visible spectrum	—4000 Å to 7000 Å

It will be noted that there is a space between the x-rays and the ultra-violet rays, which was not for some time investigated; but now that Millikan has been able to obtain a wave length of 202 Å, and Holweck has produced x-rays of which the wave length is 500 Å, we may conclude that the space which separated the ultra-violet from the x-rays is definitely bridged.

Even as they may be used together clinically, x-rays sometimes, not indiscriminately however, may be given when there is dermatitis from ultra-violet radiation. When the ultra-violet radiation is given to increase skin tolerance the reaction should be allowed to die down before administering the x-rays. In lupus, where it is desired to produce an extreme dermatitis, the best results are obtained by superimposing the x-rays upon the ultra-violet dermatitis.

The importance of using x-rays as a complement to actinotherapy is very pronounced. At the same time, it must be observed that, largely as the result of misinformed newspaper comment, there has been more demand for x-ray treatment, in any and every imaginable description of disease, than is either politic or justifiable. As a natural result, false hopes have been engendered, and disappointment has been inflicted. But, as I ventured to foretell over six years ago, the time would come, and very shortly, when the field of ultra-violet radiation would transcend even the demand for x-ray therapy at the hour of its greatest popularity. That prophecy has to-day surely been fulfilled. The combined use of these two agents is one of the newer problems, which is likely to be well worth further examination and study.

In considering team work between x-ray

* This is the eighth article in the series being published on physio-therapy. For the preceding articles see *Canad. M. Ass. J.*, 1931, **24**: 263, 409, 539, 679, 831, and 1931, **25**: 65 and 164.

and ultra-violet radiation, let us recall the way in which the former produces its therapeutic effect.

1. The endothelial lining of the blood vessels becomes œdematous, this œdema eventually occluding the artery and cutting off the nutrition of the growth, and resulting, if the treatment be pushed to that extent, in an obliterating endarteritis in the capillaries.

2. X-rays appear to have special action on new cells, on elementary embryological tissue, witness the way we are able to produce sterility by x-raying the ovarian or testicular region. Here the nucleus becomes cloudy, the nuclear membrane disappears, and then is carried away by the process of phagocytosis, and replaced by connective tissue in those cases in which the treatment is prolonged.

These and other changes that are brought about greatly depend upon the blood condition of the patient. We have seen that ultra-violet rays are actually absorbed by the capillaries, and cause chemical changes in the composition of the blood, and I mention these changes, not as a logical conclusion but rather as food for thought and a possible explanation of the way in which may be brought about the good effects of the combined use of these two agents. In the treatment of tuberculosis, Rollier has used the combination for the last ten years, and Iselin studied the subject at his clinic at Basle, and was perhaps the first worker to secure good results from their combined use.

The problem of the successful use of x-rays in conjunction with actinotherapy involves, *inter alia*, two main questions. These are the measure of sensitivity of the pigmented skin to the x-rays, and the possibility that such simultaneous and combined application may be productive of cumulative effect. Researches show that the pigmented skin is not abnormally sensitive to such treatment. Should however, the skin be exposed to the ultra-violet rays of the quartz lamp, the result is somewhat different. Thus, Rapp reported having noticed lesions of the second and third degree set up by a combination of x-rays and ultra-violet rays. If this were not intended it would appear that sufficient precaution had not been observed. Thus, if the ultra-violet rays are found to produce a violent reaction, the effect of the x-rays would naturally be to increase it. Such treatment should, accordingly, be reserved for cases where previous light treatment has already brought about a certain tolerance of the tissues. Rollier, in summing up the situation, having stressed the fact that the therapeutic action of x-rays is largely governed by the differences in the sensitivity of the cell groups, gives it as his considered opinion in regard to the cumulative effect of the simultaneous application of light and of x-rays that it would appear on the whole that no harmful consequence ensues. And if no harmful consequence ensue, and there be a possibility, even a probability, that beneficial effects will be obtained, then we are justified in pursuing our researches and extending the benefits of the combined form of treatment.

In considering the therapeutic effects of these two agents, it is interesting to contrast their several actions on the skin. Either will produce a dermatitis, but there are certain marked and easily recognized differences between x-ray and ultra-violet ray dermatitis. The former takes from eight to fifteen days, or even months or years to develop, and the latter usually occurs in a few hours from the beginning of the treatment. Again, x-ray dermatitis is apt to cause baldness, while ultra-violet dermatitis has a contrary result, and even stimulates the hair follicles. Indeed, the stronger the actinic ray reaction the better its subsequent effect on the hair growth. Atropic changes also may result from severe x-ray dermatitis. Yet ultra-violet dermatitis will, if there have been no heat-burn, not do much more than cause desquamation. The irritability of a given area to subsequently administered x-ray doses is increased by x-ray dermatitis, but it is decreased by the inflammatory reaction following a heavy actinic dosage. The cause of this increased tolerance of the skin to ultra-violet rays is not yet known definitely. We are, however, familiar with several contributory factors, which play their part in securing such a result. Among these are the loss of irritability arising from the inflammatory reaction, the tanning of the skin, and the various chemical blood changes which have an antidotal effect upon the cycle of tissue changes.

The conjoint employment of the x-rays and the ultra-violet rays in actinotherapy has been gradually evolved from careful and systematic researches into their respective local and gen-

eral effects. The discovery of the comparative ease with which x-ray dermatitis would, if not too pronounced, yield to actinotherapy vigorously applied was of the first importance and marked a big step. If, however, cicatricial tissues have already been formed, the case will not respond to actinotherapy treatment by itself. In these instances the scar must be softened or eliminated by some other means before recourse is had to the ultra-violet rays. It has been seen that in x-rays we have an agent which will effect this.

It has been held by some authorities to be a clinical error to superimpose an actinic erythema on x-ray treatment. There is abundant clinical evidence, however, to prove that this has often been done without the occurrence of any additional dermatitis. Again, during the late war, excellent results were obtained from the use of these two agents in combination in the treatment of painful scars. The more recent the formation of the cicatricial tissue, the more pronounced is the action. Apparently the x-rays disintegrate the fibrous tissue, and, as it often softens, the nerve fibres are as often relieved of their pressure. The ultra-violet rays have caused a hyperæmia, with its beneficial effects. It is still a question as to whether post-operative prophylactic radiotherapy should not be advised as a corollary to all those operations for the liberation of nerves from scar tissue, and, if so, the addition of the ultra-violet radiation will, I think, prove a valuable adjuvant.

CONCLUSIONS

The foregoing pages lead to certain definite conclusions on the subject of the employment of x-rays as a complement to actinotherapy. Mankind has always been impinged upon by the actinic rays from the sun. Such solar actinism is necessary for the protection of people climatically exposed to the sun; and thus we have negro and dark races of human beings. Accordingly, even as with the addition of x-rays to ultra-violet therapy, our range of therapeutic effects is increased, so, too, we find that the ultra-violet radiation extends the previous limits of x-ray efficacy in the treatment of disease. Up to the present, research has not gone far enough to make it possible to postulate any exact technique on this subject. Enough, however, has already been achieved to show clearly that the x-rays assist the therapeutic effects of the ultra-violet rays, and that each forms a valuable complement of the other.

As the human epidermis is Nature's protective agent against certain stimuli, the skin becomes a filter against such actinic effects as have to be excluded. The therapeutically valuable tanning that results from "sunburn" is accomplished more rapidly and under more effective control by the employment of scientific apparatus. The special function of such apparatus is to duplicate the therapeutically valuable actinic spectrum. The field of such research covers a vast and as yet only partially explored territory. Still, the essential feature of clinical research in this direction proves that x-ray and ultra-violet radiations are physiological complements, and may be used with good results in conjunction with each other. On the other hand, it is stated by Russell and Russell, "Fatal cases of exfoliative dermatitis have followed the unskilled use of these two forms of radiation." The use of the word "unskilled" here robs their statement of much point.

A final word of warning. A vast amount of nonsense is talked and written, and unfortunately believed, about the various rays on which experiments are being conducted. Some of them are being invested with all sorts of entirely imaginary tributes. Thus, one such is said to stop motor cars and aeroplanes. Another to photograph fairies, and yet another to enable its gifted operator to destroy fleets and armies at will. Some years ago, certain newspapers were full of what they called the "death ray". This seemed an echo of the war. The inventor gave a demonstration before the army authorities. He certainly projected his so-called ray, or said he did at a mouse, which immediately died. He was unable to repeat this, and the table was found to contain an electrocuting apparatus which had to be set for each experiment, and the mouse would not be killed unless it were set, regardless of any ray whatsoever. The fraud was discovered and the inventor spent some subsequent years enjoying forced labour in the trenches. Of course, not all is nonsense. Marvels are being worked to-day by the light-sensitive selenium bridge, and for a year past, with its use, street lamps have been lighted automatically as darkness of night approaches and

put out as daylight breaks. But this, television, and other actinic marvels, do not at the present come within the scope of actino-therapeutics.

There is enough material at present to occupy our minds with the correlation of x-rays with ultra-violet radiation alone, and with examining how far each may be used as a complement to the other for therapeutic purposes, without concerning ourselves with the mythical or actual powers of either established or imaginary rays.

RECENT EFFORTS TO PREVENT DEAFNESS AMONG SCHOOL CHILDREN*

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PERMIT me to express my very great appreciation of the privilege of presenting a paper before this distinguished body. I interpret the invitation to do so as a neighbourly and very courteous recognition of the work of the American Federation of Organizations for the Hard of Hearing, whose representative I have the honour to be to-day. This group, composed largely of hard-of-hearing individuals and not a few well known otologists, is international in character, having more than eighty constituent bodies, with a fine representative membership in Canada. Prominent among the objectives of the Federation is the stimulation of interest in deafness prevention and the initiation of active efforts in this special field. The deaf, more keenly than any other class, feel the urgent need of saving others from the tragedy of their own affliction. They are earnestly striving to secure for as many as possible of our future citizens the best attainable hearing acuity. This they sincerely believe must be accomplished largely through the active leadership of the otolaryngologist.

It is the purpose of this paper to briefly consider facts relating to one important aspect of the subject of deafness prevention, which in its application is already yielding practical results and promises much more for the future. The problem of the prevention of adventitious deafness is one of large proportions. In the United States, at a conservative estimate, there are five to six million people (among them one million school children) handicapped by impairment of hearing, which in the majority of cases, according to the belief of many otologists, might have been prevented. A large proportion are thus afflicted because of ignorance, indifference and neglect. Compared with what has been achieved in other fields of preventive medicine, conspicuously in diseases of the eye, little has been done to reduce the number of the deaf. Our acknowledged failure is due to factors inherent in the problem itself. Among these we recognize: (1) A lack of fundamental knowledge of the pathology of the ear because of its inaccessibility for research; (2) A traditional attitude of indifference toward all efforts at the conservation of hearing, and an almost universal tendency for the individual to neglect the care of his own ears. These conditions are frequently the result of our acknowledged failure to successfully treat cases of deafness in the past; (3) The inadequacy of our older methods of attacking the problem, inasmuch as they failed to provide both the opportunity and the proper means of securing the early detection of a slight degree of hearing impairment in the individual. Such an impairment ordinarily overlooked and neglected is often the only indication of the presence of pathological conditions which, if not promptly corrected, are likely to lead to progressive, permanent loss of hearing.

Progress in the prevention of deafness in the United States has recently been stimulated by the following facts. (1) There has been a very rapid growth in popular interest in the periodic health examination through the wide dissemination of elementary medical knowledge. (2) Through the development of the audiometer of various types by the Bell Telephone Laboratories we have been given a practical means of

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easily and accurately detecting impairment of hearing in the individual and in larger groups. (3) There has been a wide endorsement by otologists, medical men in general, and educators, of the principle that it is an important function of our public school authorities to safeguard the hearing of all school children by providing for the periodic testing of their hearing acuity by methods adequate to disclose even slight degrees of impairment. After several years of careful observation it is the conviction of those who have had the largest experience that in the use of the audiometer for the testing of the hearing of school children we have a most effective means of initiating the first step in a comprehensive program of deafness prevention.

While the exact percentage of those who develop a high degree of deafness from diseases of the ear occurring during childhood or the school period is not known, it is the consensus among the majority of otologists that a large number of such cases have their beginning in upper respiratory infections occurring at this time. If discovered early, and corrective measures were promptly applied, a cure would result in many cases, or at least an arrest of progress. It is of historic interest that the audiometer was first officially used in public school work in September, 1926, when it was adopted by the Minneapolis Board of Education. Compared with our former methods of testing hearing acuity, the use of the audiometer offers the advantages of far greater accuracy, ease of application, speed and economy. It has proved practical and so satisfactory that it has already been adopted in more than one hundred American cities and educational institutions. After five years, its use is no longer an experiment but is proving a potent factor in many communities in helping to solve the problem of deafness prevention.

Two types of instruments are used in school work. The 4-A, or phonograph audiometer, transmits by an electric pick-up the sounds impressed on a special record to from one to forty head 'phones. The record is calibrated with scientific accuracy. The children write on a special chart the spoken numbers which they hear, each new number being given with a diminished intensity which is less by three sensation units than the previous number. The first number on the record can be heard by one having a maximum loss of thirty sensation units. The sensation unit is the standard unit of measurement of hearing acuity. Obviously, only children old enough to write to dictation can be satisfactorily tested by this instrument. To ensure accuracy, each ear is tested four times. As many as forty children are tested simultaneously, giving an average rate of one hundred per hour. All who on the first test show a hearing loss of six sensation units or more are retested to avoid possible error. Because of its large capacity this instrument is especially useful in communities having a large school population.

The 3-A audiometer is employed in testing individually children below the age of ten years, those with a loss of more than thirty sensation units, the blind, and those of poor mentality or slow reaction time. This instrument consists of an electrically actuated buzzer which produces a complex sound of definite intensity embracing a frequency range corresponding to that of the human voice. The intensity of the emitted sound which is conveyed to the ear by a telephone receiver is accurately controlled by a potentiometer. Hearing acuity is read directly from the dial in per cent of hearing loss. Children of five years of age and upward are individually tested at an average rate of twenty to twenty-five per hour. This instrument alone is sufficient for the needs of the work in smaller cities and rural communities. Pupils tested with the 4-A audiometer showing a hearing loss of six sensation units are retested. Those found on retest to have a loss of six (in some cities nine) or more sensation units in either ear, and those found with the 3-A instrument to have a hearing loss of 10 or more per cent, are classified as requiring an otological examination. The parents are notified to this effect and every possible effort is made by the school nurse to secure such examination. A diagnostic ear clinic conducted by the department of school hygiene has proved helpful in this work in several cities. The methods outlined when properly supervised are applicable in rural districts as well as in city schools.

Reports received up to June 1,1929, in response to a comprehensive questionnaire sent out by the writer showed that already several

hundred thousand school children had been tested in thirty-four cities having a total population of 6,800,000. Many cities were not included because the statistics had not been compiled at the time.* An average of more than 7 per cent of those tested revealed a hearing defect of such a degree as to demand careful medical scrutiny. As a result of these examinations many thousands who would otherwise have been neglected have received needed medical care. Many retarded children, unsuspected of having hearing impairment, have been assigned advantageous seats in the class room, or have been given instructions in lip-reading, thus enabling them to continue with their classes, instead of becoming "repeaters" at a great expense to the community.

Scrutiny of the reports discloses a considerable variation in the incidence of hearing loss in different cities. These differences are explained by seasonal and climatic variations, by differences in the age of the pupils tested, by variations in the intelligence and in the economic and hygienic conditions prevailing in different groups and also by the relative amount of extraneous noise present in the room at the time the tests were made. These variations do not in any way lessen the value of the tests for the purpose of segregating from those having normal hearing the children who have a significant loss of hearing which demands medical attention. However, we must conclude from these discrepancies that there is great need for standardization of technique, and that the tests should be made by persons trained for this work and understanding child-psychology. The best results can be obtained by checking all cases found to have a significant hearing loss with the 2-A audiometer, which is easily possible in larger communities. This instrument yields an audiogram covering eight octaves which has valuable clinical significance.

A study of the results of the tests to date has brought out, among many interesting facts, the following. Children in rural communities are found to have defective hearing in far greater numbers than children in larger cities, who have the advantage of living under an efficiently administered public school health program. Younger children show a more frequent incidence of impairment than the older groups. Among the latter there occurs a larger proportion of cases with a more severe loss. Retarded pupils show a more frequent incidence of significant loss than other groups of the same school grade. The highest percentage of children with significant impairment of hearing has been found in the group with the lowest intelligence quotient, according to a recent publication of Sterling and Bell. Among college students a smaller incidence of hearing loss occurs than among less favoured groups. The influence of heredity in causing impairment of hearing is evident among the large groups tested in Minneapolis.

The movement to ultimately secure for every school child the benefit of a periodic hearing test is making rapid growth. There is need to educate the medical and lay public to an appreciation of the possibilities of deafness prevention and to acquaint them with the best means of attaining this end. The chief obstacle to the more rapid adoption of the methods described lies in a lack of understanding by the medical profession of the principles and advantages of the system. The problem is preëminently a medical one. Of equal importance with the discovery of a hearing loss is the medical "follow-up" and the skilful application of the remedy required in each individual case. Ultimately, mandatory and enabling laws will be passed providing for the periodic testing of the hearing of all school children. At the present time the most urgent need is the sympathetic, intelligent understanding and active interest of the physician, especially the otolaryngologist. The possibilities of accomplishment should appeal strongly to the medical man's sense of social obligation. Because of our better knowledge of the causation of many disturbances of the ear, and the more successful treatment by modern methods, he should to-day accept the challenge with enthusiasm and interest. Under his leadership and with the cooperation of the educator, the members of the parent-teacher groups, and the public health worker, we shall see rapid progress in incorporating the periodic examination of the ears of all school children as an important feature of every well conceived public health program.

* Since the tabulation of these reports the movement has rapidly grown and up to now doubtless well over one million school children have been tested.

UNEXPECTED AUTOPSY FINDINGS IN UNEXPECTED DEATHS*

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Hamilton, Ont.

DEATH is usually anticipated. Physiological death, resulting from senility and the gradual wearing out of organs and tissues, is probably an exceptional occurrence. The end usually comes as the culmination of some disease of whose ravages the clinician and the patient are aware. Sometimes it comes with suddenness as the result of an accident, of the imbibition of a poison, or of a sudden turn for the worse in an already existing disease, and sometimes it comes for no apparent reason. It is the unexpected cases of death to which reference is made in this paper.

When one hears of an unexpected death, one's mind usually turns to two, or at most three, of the systems of the body. One thinks first, perhaps, of the heart and circulatory system, and secondly of the nervous and respiratory systems; as a matter of fact, the majority of cases of unexpected death may be referred to one of these. But in the course of autopsy experience one learns that even in lesions of these systems there is a wide range, and that the primary cause of death may occasionally originate in other systems and tissues, though the actual termination of life may be due to the effect upon one of the three systems previously mentioned. The cases quoted have, with a few exceptions, been selected from a series of about twelve hundred autopsies performed at the Hamilton General Hospital during the past ten years. Many of the more unusual findings have been revealed in autopsies done on cases which have been the subjects of coroners' investigations, and where little or no previous clinical history is available. No doubt, some of the so-called "unexpected" findings would have been "expected" had the cases been studied clinically beforehand, but that is a condition which does not, as a rule, obtain in cases of unforeseen death.

The most common lesions of the heart which result in unexpected death are myocardial degeneration, coronary thrombosis or embolism, and infarction of the heart muscle. The following cases will illustrate some findings which in my experience at least are unusual.

LESIONS OF THE CIRCULATORY SYSTEM

Extreme fatty degeneration of the heart muscle.—A young girl had contracted syphilis at the age of 17 years. She had been treated with arsenical injections in the out-patient department of the hospital, and after the second course of treatment had developed jaundice, and was for this reason admitted to the ward. Her jaundice disappeared and her condition apparently improved. On the day before she was to have been discharged, she got out of bed to go to the toilet, as she had been doing for some days, and on the way collapsed and died in about fifteen minutes. At autopsy, the liver was found to be enlarged and fatty, and the heart weighed 350 grams and in appearance and on section was like putty. Sections showed an advanced degree of fatty degeneration of the myocardium. No other gross pathological condition was found sufficient to account for death. Apparently some undue exertion had caused interference with the conducting bundles and had caused the sudden demise. The comparative youth of the patient is the interesting feature.

Traumatic hæmatopericardium.—A hired man on a farm, aged 24, took pleasure in teasing a lad. In the course of an altercation, the boy picked up a pitchfork and hurled it at the hired man from a distance of a few feet. The man gave a cry of pain, but did not seem to be seriously hurt. In a few minutes, however, he complained of feeling faint and a physician was called, who, on arrival a short time later, found him breathing his last. Physical examination showed a very small puncture wound between the second and third ribs on the right side, with no bleeding. A coroner was notified who ordered an autopsy. Upon examination, it was found that one prong of the fork had penetrated through the lung and upper part of the pericardium, and had torn a hole in the aorta about one centimetre in length, through which blood

* Read before the Section of Pathology, Academy of Medicine, Toronto, February 25, 1930.

had been pumped until the pericardium was distended to a degree which caused cessation of the heart's action.

The same finding was observed in another case in which the wound was caused by the blade of a jack-knife in a stabbing affray between a coloured man and his paramour, the former being the victim.

Aortic stenosis.—A man of 45 was found dead in bed at his rooming house. No history of recent previous illness could be elicited. At autopsy, a hypertrophied heart, weighing 450 grams, and with a marked stenosis of the aortic valve was found. No other significant lesions were found. It is probable that in these cases the fibrosis of the myocardium which accompanies the hypertrophy may gain the upper hand and finally interfere with one or other of the conducting bundles of the heart.

Congenital absence of the ventricular septum.—The usual congenital abnormalities found are patent foramen ovale, patent ductus arteriosus, and patent ductus venosus. In this case of a new-born infant who was poorly nourished and who lived only three days, a congenital absence of the ventricular septum was found which gave the child a three-chambered heart.

Coronary thrombosis at 14 years.—A young Polish girl, aged 14, skipped 300 times at school in the morning and had a pain in the precordial region, which passed away. At noon she began her lunch, had a return of the pain, vomited, and died in five minutes. An autopsy was ordered by the coroner. The aorta was found to show a marked degree of atheroma, some of the patches showing ulceration. The mouth of the left coronary artery was almost occluded by vegetation-like masses. The first 2 cm. of the coronary was blocked by a thrombus and the surrounding tissues in this area showed inflammatory change. On going into the history, it was found that the girl had had attacks of scarlet fever, measles, chicken-pox, diphtheria and whooping cough, since the age of 6. The interesting point about this case is the age.

LESIONS OF THE RESPIRATORY SYSTEM

Lobar pneumonia.—A street cleaner, aged about 60, had been in the city employ for about five years. One day he collapsed on the street and was brought to the hospital in the police ambulance. He died about one hour after admission. At autopsy he was found to have lobar pneumonia involving the whole of the right lung, in the gray hepatization stage. The heart showed considerable myocardial degeneration. The man had been apparently carrying on his work while suffering from lobar pneumonia for several days.

Influenzal pneumonia.—A gentleman about 45 years of age had been actively carrying on his work as a manager. One morning he felt chilly, but did his work until lunch time. After lunch he became quite ill, finally going into coma and dying a few hours later. At autopsy both lungs were found to be involved by a hæmorrhagic type of broncho-pneumonia from which *S. hæmolyticus* was cultured. There was also some œdema of the lungs. The man had apparently suffered from a fulminating attack of broncho-pneumonia of the influenzal type.

LESIONS OF THE NERVOUS SYSTEM

A patient in the Hamilton General Hospital had been brought in for diagnosis with a tentative diagnosis of brain tumour. A diagnostic lumbar puncture was performed and 12 to 15 c.c. of clear spinal fluid was removed. The patient went into convulsions and died within an hour. At autopsy a glioma of the cerebellum was found, which had been pressed down into the foramen magnum so as to leave the imprint of the foramen magnum on it. The disturbance of pressure brought about by lumbar puncture had apparently caused this.

Hæmorrhage into a cerebral cyst.—A workman, aged 24, was on his way to work one morning and on getting into a motor bumped his head slightly on the top of the car. In a few minutes he lapsed into unconsciousness and was taken to a doctor's office, whence he was sent to the hospital, dying shortly after admission. At autopsy a large cyst of the anterior part of the right cerebral hemisphere was found filled with blood. This cyst was roughly 8 cm. by 6 cm. There was no evidence of neoplastic tissue in the walls of the cyst. Apparently the slight blow which left no mark on the skin was sufficient to cause a rupture of a vessel bordering on the cyst. The hæmorrhage had burst into the right lateral ventricle.

Death in epilepsy.—A gentleman was found in his apartment one morning dead with his face buried in his pillow. He had been apparently

well the night before. At autopsy there was marked congestion of the face and petechial hæmorrhages scattered over the neck, arms and chest. Internally there were the usual evidences of suffocation. It was hard to understand how an apparently healthy man of 40 could suffocate in this manner. He had explained previous periods of illness by stating that he had had a kidney removed during the war and suffered from kidney insufficiency. There was no evidence at autopsy of a kidney wound or operation, and both kidneys were of normal size and appearance except for congestion. The history secured later showed that he had been a subject of epilepsy and used this story to explain periods of indisposition. He died from suffocation in an epileptic attack.

LESIONS OF THE ALIMENTARY SYSTEM

Appendiceal hæmorrhage.—A young woman of 25 was brought into the hospital, having been ill for three days and having passed blood from the bowel on the day previous to admission. She was very anæmic. A diagnosis of typhoid was made, but Widal tests were negative. She died on the day following admission. At autopsy the appendix was found to be thickened, ulcerated and imbedded in a mass of adhesions. Dissection showed that it contained a small pin about 2 cm. in length. Ulceration had taken place, but without rupturing the appendix externally. The lumen of the appendix was patent and had served as a drainage tube for blood coming from an eroded artery. The patient died of hæmorrhage.

An infected Meckel's diverticulum.—A young man of 23 was admitted to the hospital with a diagnosis of general peritonitis. A drain was inserted, but he died on the third day after admission. At autopsy a small piece of impacted fæcal materal was found in a badly ulcerated Meckel's diverticulum, and this appeared to be the starting point of the infection.

Traumatic rupture of the spleen.—A young soldier in Macedonia during the late war had had repeated attacks of malaria. He was thrown from his horse one day and went into a state of collapse from which he did not recover. He died the next day. At autopsy he was found to have a large spleen (2,000 grams) which had been ruptured by the fall.

LESIONS OF THE GENITO-URINARY SYSTEM

Unexpected death occasionally occurs from acute uræmia. A boy of 16 was admitted from a Boy's Home in coma. At the time no history of nephritis could be obtained. He died the next day. At autopsy, contracted kidneys were discovered. Further inquiry elicited the fact that the boy at the age of 8 had had a very mild attack of scarlet fever. He died within 48 hours of acute uræmia.

STATUS LYMPHATICUS

Every pathologist must carry in his mind this condition in cases of unexpected death in young people. The following case illustrates this condition. A boy of 12 was in a boat on the bay with several older boys. An altercation arose and one of the boys struck at him with an oar. He fell overboard and never rose to the surface. The body was recovered some hours later. Autopsy showed no evidence of injury and absolutely none of the evidences of drowning. It did reveal, however, the classical anatomical evidence of status thymico-lymphaticus. The thymus weighed 45 grams. There was great hyperplasia of the lymphoid elements, especially of the mesenteric glands and the lymphatics of the colon, with relative hypoplasia of the heart and aorta. The boy had apparently succumbed to the shock occasioned by sudden fear.

VIOLENT DEATHS

Rupture of the duodenum.—A workman in a sand pit was crushed between the wall of the pit and the hub of a wagon. He was admitted to hospital, and two days later showed symptoms of obstruction. No operation was performed and he died the next day. At autopsy no peritonitis was found, but dissection of the duodenum showed it to have been torn across by being pinched against the vertebral column. The surrounding retroperitoneal tissues were inflammatory and to some extent infiltrated with duodenal contents. There was a small hæmatoma at the root of the mesentery.

A bullet in the aorta.—A workman was shot through the chest in a brawl. Post-mortem examination showed the bullet to have traversed the right side of the chest, struck the body of the fifth thoracic vertebra, and made a hole

at this point in the aorta. It was found in the aorta at a point about 3 cm. above the bifurcation.

Acute pulmonary œdema. — In several accident cases, death has been caused by the onset of œdema of the lungs when the injuries seemed trivial. It is no doubt associated with shock to the nervous system. No doubt many pathologists have had experience of cases similar to many of the above. I hope, however, that a few of them will be of sufficient interest to justify this paper.

Case Reports

EXTENSIVE RESECTION OF THE SMALL BOWEL FOLLOWING TRAUMA IN WHICH 261 C.M. (102¾ INCHES) WERE REMOVED WITH RECOVERY

By E. L. Garner, M.B., F.A.C.S. and G. W. Bissett, M.D., C.M.,

Duncan, B.C.

B. C. W., aged 40 years, a man of fine physique, was employed by the McDonald Murphy Logging Company as a fireman on a donkey engine. At 11 a.m. November 1, 1930, he was standing on a 30-inch log, about two feet from the deck of the donkey engine, while the straw line, a ⅜ inch steel cable, was being drawn in on the drum toward him. It became caught, and, under high tension, broke about 50 feet away from him, the end whipping one and one-half times around his body, just above the iliac crests, the tip apparently striking him about the mid line in front. He was thrown about three feet off the log. He was dazed, but staggered to his feet just as assistance reached him. He received first aid and was brought eight miles by rail over a rough logging railroad in the mountains to the lake, where Dr. Wallace A. Coburn examined him, and advised immediate operation. He gave him morphine gr. ¼ and atropine gr. 1-150 hypodermically. The man was then transferred to a speed boat which took him six miles to the foot of the lake. Here he was met by the ambulance which took him twenty miles over a gravel road to the hospital in Duncan. After arrival at the hospital, and after confirmation of the decision to open the abdomen, he was given another hypodermic of morphine and atropine. He was catheterized without difficulty, and no hæmaturia found. He was then radiographed, in search of possible fracture of lumbar processes, or compression fracture of the vertebræ, but none were found.

Examination of the abdomen revealed two horizontal linear abrasions, with some subjacent contusions, about one inch wide, just below the umbilicus, one crossing the full width of the abdomen, and the other over the left side of the abdomen, parallel to the longer one, and just below it. To the touch, the abdomen was hard and board-like, and exquisitely tender upon pressure. The patient complained of severe pain in the abdomen and had the distressed anxious facies so characteristic of acute extensive peritoneal irritation. Tympanites was not marked. The pulse was 124 and respiration 22. His blood pressure was 140/70.

The man was taken to the operating room at 5.45 p.m. six hours and 45 minutes after he had received the injury. Dr. Wallace Coburn assisted, the anæsthetic (ether) being given by Dr. Geo. More, while Dr. Wiggins gave 5 per cent solution of glucose in normal saline solution intravenously. A left paracentral incision from the pubes upward revealed a complete horizontal rupture of the recti muscles, as if they had been cut by a knife, at the level of the skin abrasion. Within the peritoneal cavity, the ileum was completely ruptured in a number of places, with many ruptures of the mesentery. Bleeding points in the mesentery and bowel were controlled, and devitalized portions were cut away. A remarkable feature was the extensive and destructive ruptures of the mesentery, which devitalized much of the bowel that required removal. At a number of points there were hæmorrhages between the peritoneal layers of the mesentery, without their rupture. Searching upwards and downwards, the bowel was clamped and severed at the first point where its integrity was assured and all other portions were removed. The torn mesentery was sutured, and an end-closure with

isoperistaltic lateral anastomosis was done through the longitudinal band in the cœcum. The appendix was not removed. The peritoneum was carefully mopped clean, and a few stitches of plain catgut tacked the mesenteric folds into a comfortable position. The abdominal wound was closed, drainage being secured by stab-wounds, through which two cigarette drains reached the pelvis, and the region of the anastomosis. During the operation the patient was given 2150 c.c. of 5 per cent glucose in normal saline. This was given intravenously very slowly throughout the operation, a period of two and one-half hours.

Upon the return to the ward his condition was poor; marked pallor; pulse 144; respirations 24. In about three hours, upon becoming restless and attempting to sit up in bed, he was given morphine gr. ¼ and atropine gr. 1/150. During the night his pulse was weak and thready, with a rate of 150. After midnight he was given normal saline rectally by Murphy drip, and later 800 c.c. was given interstitially. Every hour he was given a hypodermic of strychnine, gr. 1/30, alternating with a 1 c.c. ampoule of caffeine-sodium benzoate, until 8 a.m. and during this time there was some improvement in his condition, his pulse coming down to 120. He had some hæmorrhage from the wounds, and was given hæmostatic serum intramuscularly, and 10 c.c. of calcium chloride solution intravenously.

During the first post-operative day his condition was not good. His pulse, which was at times very thready, ranged from 160 to 115; temperature 100° to 101°. He was restless and complained of severe pain in the abdomen, for which he was three times given morphine and atropine hypodermically. He was able to retain small quantities of water, by mouth. He also complained of great thirst and was given 810 c.c. of normal saline rectally by Murphy drip. Interstitially, he received 800 c.c. of normal saline and later 500 c.c. of two and one-half per cent solution of glucose in saline. His systolic blood pressure was 150, a few of the beats coming through at higher points, up to 170; the diastolic was 70.

The second post-operative day showed a definite improvement, the pulse ranging from 120 to 110, the temperature showing no decline. He was still suffering much pain with marked restlessness, and was twice given morphine and atropine. By mouth he retained water, hot tea and orange juice. Interstitially he received 500 c.c. of normal saline and 1000 c.c. of a two and one-half per cent solution of glucose in saline. Just forty-eight hours after the receipt of his injury he passed much flatus and a large brown liquid stool by rectal tube, after which fairly normal peristalsis continued. His systolic blood pressure was 140, with a few impulses reaching 150, the diastolic being 60.

His third post-operative day brought a marked improvement in his general condition, with a pulse of 85 to 100, of much better quality, and no change in his temperature. His diet included orange juice, milk and vegetable soup, ovaltine and bovril. He was given interstitially 1000 c.c. of 2½ per cent solution of glucose in saline.

On subsequent days his diet was gradually extended till he was taking solid food. On two occasions he had frequent liquid stools, but this condition was easily controlled by a change in diet and bismuth. There was at first considerable drainage from the wounds, but this gradually lessened and the wounds were healed on December 7th. Sugar in small quantities was present in the urine, until the 8th post-operative day. He was first able to be up out of bed on December 7th. He had at times transient attacks of cramp-like pain in the right lower abdomen.

Previous to his accident his weight was about 170 lbs. On December 8, his weight was 132, on December 16, 135, and on December 23, 136 lbs. He left the hospital on December 29th for his home in Vancouver.

The following is a copy of a letter from Dr. Wallace Wilson, of Vancouver, dated March 2, 1931.

RE B. W—.

"The marginally noted man came to me on reference from the Workmen's Compensation Board on January 5, 1931, complaining of pain in the abdomen and diarrhœa which he stated dated from his accident on November 1, 1930. 'Every time I eat anything, it runs right through me.'

"He states that his bowels move anywhere from six to twelve times during the day and at least once every night. The bowels move immediately after taking food. Some pain when

the food enters his stomach and this pain lasts for about an hour; also some pain close to the anus when the bowels move. He complains that his back feels weak, that he urinates frequently during the day and once or twice every night, in addition to voiding when his bowels moved.

"An x-ray of his gastro-intestinal tract showed marked hypermotility throughout, but nothing else except some pleuritic adhesions in the left lower chest. The chest showed nothing clinically. The abdomen was negative except for some tenderness. Urinalysis was negative. I admitted him to hospital. He remained in hospital from January 8 to 16, 1931. I put him on a constipating diet, a mild bismuth mixture and tincture of belladonna. A couple of days before his discharge the belladonna was stopped because of complaint of dry mouth, and his pupils were somewhat dilated.

"On discharge, he was having only one bowel movement per day and his frequency of urination had stopped. He was quite nervous and did not like the hospital because of other patients in the ward with him. Since his discharge he has been on a small dose of elix. of bismuth hydrate and, as he was somewhat nervous and was not sleeping well, a small dose of luminal.

"He has had no further symptoms as far as his bowels are concerned and no frequency in urination. His appetite is good and he is now sleeping better. His weight when I first saw him was 138 pounds. His weight is now 150½ pounds. The main difficulty I have had with him since his discharge from hospital has been his nervous system. He complains of his heart troubling him at times and of some headache over one side of the head and that at times he feels some swelling around his ankles, but I have never found any."

The following is the report of the pathologist, Dr. J. H. Moore, of the Royal Jubilee Hospital, Victoria, B.C., dated November 28, 1930.

"Two segments of small intestine were examined; both had been in formalin twenty-eight days. The length of the first was 51 inches; the length of the second, 51¾ inches.

"Lesions were found in various locations, as follows. Rupture of all coats but the mucous and submucous, (one); peritoneal rupture only, (one).

"Almost complete ruptures of bowel, held only by pieces of tissue, etc., opposite the mesentery; these ruptures are about two inches apart, (two); peritoneal rupture where mesentery joins the small intestine, (one); rupture involving all but mucous coats, (one); in several places there are round areas like low diverticulæ in which all coats have been ruptured except the peritoneal; a number of ruptured mesenteric vessels with coagula and no rupture of either peritoneal layer of the mesentery."

In the very complete survey of the literature given in the fourth edition of "Abdominal Operations", by Lord Moynihan, the most extensive resection of the small bowel, in a case of trauma with recovery, is given as 255 c.m., whereas this case is 261 c.m.

SUMMARY

In summarizing we should note the following points of particular interest: the long and difficult trip to the hospital (36 miles); early operation, less than seven hours after injury; the free use of sedatives, after the decision to operate.

Extensive rupture of the bowel with rupture of the inner coats predominating; also extensive rupture of the mesentery, as from an explosion by the compression and release of an enclosed gaseous and semi-fluid medium.

The excellent results following the free use of fluids, 2,150 c.c. of 5 per cent solution of glucose in saline during the operation, and the further use of 5,410 c.c. saline and glucose solution interstitially and per rectum during the first three post-operative days.

One further notes the loss to the patient of another 5 c.m. of ileum at the ileocecal valve.

A CASE OF UNDULANT FEVER IN MONTREAL

BY L. P. NELLIGAN, M.D. AND
K. I. MELVILLE, M.D.,
Montreal

Very few cases of undulant fever have been reported from the Province of Quebec, and as far as we are aware the disease has never been cited among the inhabitants of the large urban centres. Stalker and Ross[1] recently reported two cases in the vicinity of Montreal, but these were both farmers, and although the authors

doubted the bovine origin of the disease here the possibility of direct exposure to this recognized source of infection existed. In our own case, on the other hand, the patient presented no greater risk of exposure to the disease than the average city-dweller, and, although the origin of his invasion remains unsolved, the case is reported mainly to draw attention to the disease entity in Montreal, so that its possibility must be considered, even in the city, as a cause of pyrexia associated with vague intestinal symptoms. It is too early yet to indicate the true incidence of the disease here, but it is not unlikely that increased watch for it will lead to its increasing recognition, as was the case in the United States between 1905 and 1929. Epidemiological findings in States other than Iowa, as reported by Hardy and his collaborators,[2] indicate that, whereas from 1905 (when the first case was reported) until 1924, there were only 128 cases, in the years 1927, 1928 and 1929, there were 217, 647, and 1,305 cases reported respectively. Such data, along with the increasing recognition of other sources of contamination besides milk or direct contact with infected cattle, should be of some concern, and warrant more frequent suspicion of the disease. Indeed, it has been recently shown by Violle,[3, 4] that city birds of various species (pigeons, chaffinches and thrushes) can be experimentally inoculated with *Brucella abortus,* so that the disease might well be brought to the city by these carriers from neighbouring infected areas.

CASE HISTORY

M. W. W., a male, aged 52.

On December 15, 1930, the patient complained of pain in the upper quadrant, nausea but no vomiting, headache, fever and chills with night sweats. His bowels were regular and the stools normal. The pain was of a dull aching type, not relieved by the taking of food or by posture. Nausea was present whether food was taken or not. Chilliness was felt during the mornings, but there were sensations of heat in the afternoons and evenings. Nine "adjustments" carried out by an osteopath in Montreal failed to relieve the symptoms, which continued with irregular remissions until February 1, 1931, when the patient was first seen.

A city salesman by occupation, the patient was never in contact with cattle or pigs. He did not drink milk, except in tea or coffee. Apart from the usual childhood diseases he had never been ill. He was married and his wife and six children were all alive and in good health. He had never lived outside of Canada.

Physical examination. — Temperature 103.4°; pulse 108; respirations 20. The patient appeared to be quite comfortably resting, with a cheerful alert expression. His colour was quite good; the skin was moist and hot; there was definite evidence of loss of subcutaneous fat. The patient said that he had lost about 30 pounds in weight during the previous six weeks. His pupils were equal and regular, reacting well to light and accommodation. There was no evidence of disease of the nose, teeth or throat. His tongue was coated. There was no glandular enlargement.

General systemic examinations were negative, except for his abdomen which was rather pendulous and slightly distended. Movements were free and without pain, but upon palpation there was definite tenderness in the right upper quadrant, but no rigidity, localized tenderness or masses. There was no enlargement of liver or spleen. Rectal examination was negative.

Urinalysis.—The urine was clear and acid in reaction; specific gravity 1020; a trace of albumin; no sugar. Microscopically, there were amorphous phosphates, no pus cells and no casts.

Blood examination.—There were 4,980,000 red blood cells, 11,800 leucocytes; hæmoglobin 95 per cent. The differential count was not done. The Wassermann reaction was negative. There was no agglutination of *B. typhosus, B. paratyphosus A and B,* or *B. tularense,* but there was agglutination of the *Brucella abortus* in a dilution of 1 in 640. (Report from the Deptment of Health of Ontario).

Temperature readings.—The temperature of the patient, as recorded twice daily during the month of February, showed striking evening rises. The average temperature in the morning was 99°, while in the afternoon and evenings the temperature ranged from 101° to 103°. The pulse rate was usually 90 per minute in the forenoons, but rose with the temperature to about 110 later in the day.

The treatment employed was purely symptomatic, including rest, hydrotherapy and antipyretic drugs (phenacetine and aspirin) which

latter had very little effect upon the course of the fever. On February 20, 1931, the patient's temperature and pulse returned to normal, and his headache and intestinal symptoms gradually disappeared, and he has since been quite well.

Two months later he was asked to report, and the blood again taken. This specimen also agglutinated the *Brucella abortus* in a dilution of 1 in 640 (Report from the Quebec Provincial Bureau of Health, Montreal).

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A CASE OF EXTROVERSION OF THE URINARY BLADDER

BY J. S. MCEACHERN, M.D.,

Calgary

L.U., a female infant aged twelve weeks, was referred by Dr. R. J. Chrystal, of Carstairs, on September 28, 1917. About twelve noon the child had cried very hard. The mother noticed that a mass was protruding from the vulva about one inch long, and as large around as a man's finger. The parents drove at once to the family physician. He saw the child at 4.30 p.m. He manipulated the mass and reduced it. Thinking that it had protruded from the cavity of the vagina he packed the vagina with a narrow strip of iodoform gauze and sent the child in to Calgary. I saw her late at night. She was sleeping soundly so was sent into hospital. The following morning, which was Sunday, the gauze pack was withdrawn. The vulva was normal in appearance. Arrangements were made to examine her under anæsthesia on the following morning.

Before I left the hospital the nurse sent me a message that something was protruding from the child's vulva. Accompanied by Dr. A. I. McCalla we again saw the child and found a dark bluish moist mass protruding. It was about the size of a medium-sized plum. When caught between the thumb and finger it collapsed like the skin of a grape from which the pulp has been expressed. Lifting it forward urine could be seen oozing down from its posterior aspect. It is perhaps not creditable to either of us, but even then we did not recognize the condition. Gentle upward pressure caused the mass to disappear suddenly.

Next morning, ether anæsthesia was administered by Dr. McCalla; Dr. T. H. Crawford was with us in the operating room. Using a small retractor as a Sim's speculum one could inspect the interior of the vagina and see the cervix. Nothing abnormal could be seen. The anæsthetic was stopped. The child began to retch and vomit, while we were watching the vulva. Slowly the urethral orifice was seen to dilate just as does the anus of a horse in the process of defæcation. Then a mass was suddenly extruded through it. The mass quickly became a deep bluish black. Pressure between the finger and thumb flattened it out. Lifting it forward we could see the orifice of one ureter. Jets of urine came from it at intervals. Only one ureteric orifice was seen. The extroverted bladder was again easily reduced. The child was put to bed with the foot of the cot elevated. It was kept under observation until October 27th when it was sent home. No treatment other than the administration of diet suitable to its age was given. There was no recurrence of the trouble during its stay in hospital or subsequently.

I examined the child in my office again on August 11, 1926, when she was nine years old. She was apparently normal in every way. Her father, who accompanied her, stated that during the first two years of her life her clothing was wet almost constantly. From that time on there was a rapid improvement in control. For the past three or four years she has had normal control. She never wets the bed. She does not rise at night to urinate. During the day she voids four or five times.

This condition appears to be one of extreme rarity. I have been able to find in medical literature reference to only a very few cases.

AN UNSUSPECTED CASE OF LEUKÆMIA*

BY N. B. GWYN, M.B.,

Toronto

It might be of interest to both surgeons and physicians to refer to the unexpected blood

* Read at the Academy of Medicine meeting, held at Christie Street Hospital, Toronto, in December, 1930.

picture found in a man who had been under our observation for nearly nine months. In the early days of his illness this man's complaint had merely been that he had persistent pain below his right scapula. Since he had a foreign body left *in situ* in this neighbourhood it had always been assumed that his complaint might have some relation to the missile imbedded in the tissue. It was the opinion of all surgical examiners that the pain was not related to the retained foreign body. The persistence of the radiating pain in a man obviously not given to undue complaining, had induced the observer in the clinic to put the patient through careful x-ray and neurological examination. Nothing definite was ever determined; no sign of a spinal tumour was ever made out and the cause of his radiating pain remained quite obscure. As time went on, it was quite apparent that the man was losing weight and becoming distinctly weak, and the routine blood count, made at this time, gave the first clue as to what had been going on. In a leucocyte count of 300,000 per c.c., there was a high percentage of myelocytes and the typical picture of leukæmia. The suggestion is, on the face of this finding, that there is perhaps some infiltration about the spinal cord which does not reveal itself under the x-ray. On the other hand, it may just be that the persistent neuralgia is merely an odd symptom of leukæmia. The spleen was found to be much enlarged; there was no glandular enlargement, no tenderness of the bones, and the man's general condition seemed good. He was subjected to intensive radium treatment at the hands of Dr. Richards in the Toronto General Hospital, with the usual rapid improvement as far as the blood count is concerned; this dropped from 300,000 to 18,000 within a matter of a few weeks. There has been no real improvement as concerns the pain complained of in the first place, and of late the weakness which has developed has made necessary the withdrawing of the man from his daily occupation.

The following lines are taken from "The hye way to the Spytell hous" (circa 1536), in which Robert Copland speaks with the porter of a London Hospital, probably St. Bartholomew's.

THE SPYTELL HOUS

Copland

Syr, I pray you, who hath of you relefe?

Porter

Forsoth they that be at suche myschefe
That for theyr lyvyng can do no labour
And haue no frendes to do them socour
As old people seke and impotent
Poore women in chyldbed have here easement
Weyke men sore wounded by great vyolence
And sore men eaten with pockes and pestylence
And honest folke fallen in great poverte
By mischaunce or other infyrmyte
Way faryng men and maymed souldyours
Have theyr relyef in this poore hous of ours
And all other which we seme good and playne
Haue here lodgyng for a nyght or twayne
Bedred folke, and suche as can not craue
In these places moost relyef they haue
And yf they hap within our place to dye
Than are they buryed well and honestly
But not euery unseke stoborne knaue
For than we should ouer many haue.

DIRECT TRANSMISSION OF HERPES LABIALIS.—Despite the numerous observations and experiments of recent years on the infective nature of herpes simplex, there is as yet no evidence that in the human subject it is normally spread by direct contagion, though in the case of herpes labialis opportunities for such spread must be very frequent. K. Scheer (*Münch. med. Woch.*, April 10, 1931, p. 613) records that, of his own two children, the boy suffered from periodic attacks of herpes labialis, usually on the lower lip, while the girl had never suffered from herpes. In December, 1926, she had typical bilateral herpes zoster on the back, and two days afterwards the boy developed varicella. There was thought to be an association between the two conditions, but fourteen days later still the girl, whose herpes had now healed, also developed varicella. In May, 1930, the boy, who was suffering from one of his periodic attacks of herpes labialis, bit his sister on the chest in the course of a bedtime scuffle. The teeth marks were definite, and pigmentation of the area was still present when, eighteen days later, a typical herpetic eruption developed at the site of the bitten skin. The author comments that the incubation period here was longer than that which has been recorded in the experimental transmission of herpes. —Abs. *Brit. M. J.*

SODIUM AMYTAL AND THE DISEASED HEART.—Sodium amytal is regarded by some as a highly dangerous drug because of its effect on the lungs if the least overdose is administered. On the other hand, it is extolled in a recent paper for its safety in patients with diseased hearts. The authors find that it has little direct effect on diseased heart muscle, and that as only slight circulatory changes are associated with its administration, and as the tone of the voluntary muscles is maintained, the drug is peculiarly valuable for inducing narcosis in heart disease patients. The case is related of amputation of the leg for gangrene in a man of 64, the subject of auricular fibrillation with myocardial degeneration. Rectal use of sodium amytal with novocain locally was a complete success. Another patient, who had myocarditis and angina pectoris, was relieved of an attack, which did not yield to half a grain of morphia, by an intravenous injection of 3 c.cm. of a 10 per cent solution of sodium amytal. He went to sleep within three minutes of the injection and slept for 18 hours.—J. O. Bower, J. C. Burns and H. A. K. Mengle, *Am. J. Surg.*, 1930, **10:** 469.

Editorial

THE DIAGNOSIS OF CANCER BY SPECTRO-PHOTOMETRY

IT has long been known that the blood serum of cancer subjects presents biochemical and biophysical peculiarities as compared with normal serum. The hope has been that it would eventually be possible to devise a reliable specific test for the presence of cancer, based on such peculiarities. This hope has not been realized, although sufficient success has been obtained to warrant a continuation of the quest. An increased anti-tryptic power of the blood of cancer patients was first discovered by Brieger and Trebing; an alteration in the surface tension of the blood serum in cancer was developed as a test by Ascoli (known as the meiostagmin reaction); a lipase co-enzyme reduction reaction has been thoroughly studied by Shaw-Mackenzie; that antianaphylactic substances are present in the blood serum of cancer subjects was claimed by Ransohoff; complement deviation has been recorded, using antigens derived from tumours of the same or a similar order; then, we have the tests of Weichardt (epiphanin reaction), Stammler, Ransohoff, Botelho. Of most of these tests we may say that the observations of their originators have not always been confirmed, and of all of them that there are so many exceptions to the rule that their specific nature has not been established. This is not to say, however, that they have no value from the standpoint of diagnosis.

Any test for cancer based on biochemical or biophysical considerations will fall short of the full requirements if it fails to detect cancer in its incipiency. It is usually easy to diagnose cancer by the ordinary methods when it is well developed. Nevertheless, such a test might well prove of service, for example, to determine the recurrence or otherwise of cancer after operation, or to measure the progress of a case. Possibly, however, the limitation suggested may prove, after all, to be academic rather than actual, should the theory prove to be correct that cancer is due to some preexisting blood dyscrasia or idiosyncrasy. Recent developments in the laboratory diagnosis of cancer have served to raise our hopes again.

Dr. S. G. T. Bendien, of Zeist, Holland, has recently published an important research on this subject*, and his work is attracting much attention at the present time. In brief, his technique is as follows. The serum to be tested is flocculated by various mixtures of acetic acid and sodium vanadate, and the precipitate so obtained is dissolved in a two per cent solution of sodium bicarbonate. This solution is then submitted to spectrophotometric analysis. From a series of spectrograms the extinction coefficients are obtained, and from these a curve is plotted on which the diagnosis is based. Dr. Bendien does not claim that he can make an accurate diagnosis in every case of carcinoma, but he does say that a positive reaction is never found in any other disease. If this be true his test is far in advance of any so far advocated. Furthermore, and this is a point of much interest and, indeed, importance, he has been unable to discover any specific characters in the serum of patients suffering from sarcoma.

In the light of these findings, Dr. Bendien holds to the view that cancer is a local disease which can develop only if a specific abnormality of the serum be present. Should this prove to be true, the implications, of course, are far-reaching. Not only may it be possible to diagnose cancer in the earliest stages, when positive diagnosis is of the most value, but even before it has developed. In other words, it may be possible to detect the predisposition to cancer. Furthermore, it may be possible to determine more fully something of the biochemical and biophysical derangements that accompany and characterize the cancerous process, which, indeed, may prove to be the cause of cancer. This, at the moment, seems to be mere speculation. Yet, the studies of other workers point in the

* Bendien, Specifische Veränderungen des Blutserums, Jena, Gustav Fischer, 1931.

same direction. The experiments of Maude Slye, in which she was able to produce in animals a susceptibility of such high degree that one hundred per cent developed cancer after the application of a simple irritant are to the point here. This result may be explained as inheritance, but it is the inheritance of a diathesis and implies a change of constitution in a special direction. Also, the experimental production of cancer by painting a skin surface with tar has shown that there are in tar certain substances that have specific properties; for not every kind of tar will produce cancer. The facts that these specific irritants do not produce an immediate effect, but that a more or less prolonged latent period must elapse before cancer develops, and, furthermore, that cancer may develop long after the application of the tar has been discontinued, both support the idea that in these cases a disposition towards cancer has been induced. As Scherber suggests, the irritant takes the place of heredity in creating a general or local susceptibility to the disease. At any rate, it may be taken as established that chemical changes take place in the bodies of those afflicted with cancer which are closely bound up with the origination of cancer. This line of investigation promises to be fruitful. As a corollary to this, it may be possible, as Dr. Bendien suggests, to devise some therapeutic measure which will cause the abnormal serum to become normal and, so, unpropitious for the development of cancer. We are indebted to the *British Medical Journal* for the account given here of the test to which Dr. Bendien's method was subjected at the instance of the British Empire Cancer Campaign. Dr. Alfred Piney, Secretary of the Investigation Committee of this organization, went to Holland, taking with him thirty-eight tubes of blood serum which had been collected by an independent physician from patients suffering from various diseases, such as cancer, diabetes and rheumatism, together with some taken from normal patients, to serve as controls. The diagnoses in question were listed by the physician referred to and placed in a sealed envelope. Dr. Bendien was able to examine only twenty-one of the specimens, and of these he diagnosed five as being from carcinoma patients. When his diagnoses were compared with those found in the sealed envelope they were found to correspond. In one instance he made a tentative diagnosis of carcinoma, in the case of a man on whom prostatectomy had been performed, but, unfortunately, no histological report was available. This is all distinctly encouraging. The British Empire Cancer Campaign is satisfied that a distinct advance in the diagnosis appears to have been made. Of course, time must be allowed to elapse before these findings can be properly appraised. Much more work must be done, and by observers in other lands as well. The investigation is being started immediately at the Cancer Hospital in London. A.G.N.

OUR VITAL STATISTICS

NO physician regards the preparation of a death certificate as a gladsome task. It brings him neither satisfaction nor κῦδος. It is, in effect, a signed confession of defeat, and makes him feel like the thirty cents which is provided as a fee in some highly enlightened places. A certificate of birth is made out under happier conditions and usually at a moment when the doctor, at least, is exultant. But both of these certificates are written under compulsion, to which only the angelic can submit without some display of feeling, and as the doctor writes one or the other he is apt to say or think "*Cui bono?*" If the question is asked, two or three years elapse before the answer comes. In the meantime the statistician has been at work, has scrutinized the certificates of all the doctors from sea to sea and from the river to the end of the earth, has used his head and his hands and his weird machines, and at last presents compilations and analyses of the doctors' failures and triumphs.

The vital statistics of Canada for the year 1928, recently published, form a volume of no mean size, replete with information of real, though somewhat melancholy, interest to the profession. Data from 236,757 birth certificates and 109,057 death certificates entered into the preparation of this volume,

so the writing of all those certificates did not go for naught. The labour of other than medical hands, however, must be utilized in the fulfilment of the statistician's demands —to effect the necessary correlation of the medical data with data relative to population, and to complete a document which, by comparison with previous compilations, shows something of the progress we are making.

The Canadian birth rate for 1928 was 24.5; the crude death rate was 11.3; the natural increase in population was 127,700. The province of Quebec again leads in the birth rate, and with a very handsome margin. The birth rate for Quebec was 31.6, while that for British Columbia was only 17.8, the other provinces taking intermediate positions. Nearly 3,000 twin births and 34 triple births were recorded. For every thousand girls, 1,054 boys were born. Of all mothers, 72.5 per cent were Canadian-born, 12.5 per cent were of British birth and 15.0 per cent were of foreign birth. In Prince Edward Island, 95.9 per cent of the mothers were Canadian-born and only 1.8 per cent were of foreign birth, while corresponding figures for Alberta, at the other extreme, are 38.0 per cent and 44.1 per cent respectively. Of the several provinces British Columbia furnished the largest proportion (33.7 per cent) of British-born mothers.

The infant mortality rate for the Dominion was 89.5—the best in our history. In 1927 this rate was 94.0. Of the provinces, British Columbia can plume herself on having the lowest infant death rate (50.5), while Quebec's rate (123.6) is the highest. Nearly half (48.8 per cent) of the infants who died failed to survive a single month. September and December were the months in which the largest number of infant deaths occurred; July and June gave the best figures. The conditions which contributed most largely to infant mortality were premature birth (21.6 per cent), diarrhœa and enteritis (18.4 per cent), congenital debility (11.0 per cent), pneumonia (10.4 per cent), and injury at birth (4.8 per cent); influenza accounted for 3.9 per cent, and whooping-cough for 2.2 per cent of infantile deaths, but other communicable diseases were unimportant factors. Most of the cities are credited with higher infant mortality rates than for 1929, only four (Halifax, Hamilton, London and Vancouver) having improved their rates.

It may be said, parenthetically, that while the infant mortality of Canada continues to improve slowly, we must still confess a poor showing in comparison with the Mother Land and other Dominions. New Zealand's wonderful record in this particular remains unbroken, her rate for 1928 being 36.2, while Australia's rate was 53.0. For England and Wales the rate was 65.1. Nearly all of the countries of northern Europe have much better rates than we can claim. The contrast with the rate of the United States registration area (68.7) is not so striking, but quite sufficient to make us discontented.

The maternal mortality rate (5.6) was the same as for 1927. There was not the usual wide variation in this rate between the different provinces, the range being from 5.1 in Manitoba to 6.8 in Alberta. Comparison of our maternal mortality rate with that of other countries is even more disconcerting than comparison of infant mortality rates. The United States registration area, whites (rate, 6.3), gives us a little consolation, but we are quite abashed by the rates of Italy, Sweden, Japan, France, Norway, Hungary, Netherlands, Spain, and England and Wales, which range from 2.6 to 4.4. It has been urged that our high rate is due in part to the inability of foreign-born mothers to adjust themselves to the climate, food and other factors of their new environment, but the 1928 rates are almost the same in all provinces although the proportion of foreign-born mothers varies greatly in the different provinces. Of the 1,331 maternal deaths recorded for 1928, 439 were attributed to puerperal septicæmia, 330 to albuminuria and convulsions, and 173 to hæmorrhage. In other words, more than 70 per cent were due to controllable causes. This must surely be considered reason for very earnest thought.

The crude general death rate was 11.3; the adjusted rate 11.0. This is somewhat higher than for 1927. Nova Scotia and Quebec improved their rate somewhat; Manitoba and Saskatchewan held their own; the other provinces lost ground. The adjusted rates give the premier place to Saskatchewan (rate, 8.1), while Quebec brings up the rear

with the rate of 13.3. Our general death rate (crude) does not compare unfavourably with that of most other countries. We must doff our hats, however to New Zealand and Australia, where the rates were 8.5 and 9.5, respectively. Norway and Denmark had slightly lower rates than Canada. In England and Wales the rate was 11.7; in the United States registration area, 12.0. In Canada the death rate reached its highest points in December (14.4) and March (12.0); its lowest points in July (9.7) and August (10.0). Prince Edward Island differed from the other provinces in choosing February rather than December for its month of highest mortality.

During the year seventy-nine centenarians departed. Thirteen of these deliberate leave-takers were Nova Scotians, and the Bluenose Province retains the record for making the most generous proportionate contribution to the list of centenarian decedents.

To specific death rates, we must be content with a few references. Diseases of the heart are credited with the rate of 131; by provinces, the rate ranges from 174 in Ontario to 67 in Saskatchewan. Diseases of the arteries, cerebral hæmorrhage and nephritis are given rates of 59, 32 and 59, respectively. Saskatchewan is the low line for all these conditions. The rate for cancer is 88, ranging from 114 in Prince Edward Island to 55 in Saskatchewan. All the western provinces, where the proportion of older people is less than in the east, have relatively favourable cancer rates. For pulmonary tuberculosis the rate is 67, ranging from 101 in Quebec to 35 in Saskatchewan; while for other forms of tuberculosis the rate is 14, ranging from 21 in Prince Edward Island to 9 in each of Ontario and Saskatchewan. The cancer rate thus considerably exceeds the combined tuberculosis rates. Pneumonia stands next to cancer, with a rate of 87, ranging from 116 in Prince Edward Island to 61 in British Columbia. Of other communicable diseases influenza ranks first in importance—rate, 49, ranging from 62 in Quebec to 21 in Prince Edward Island. Diphtheria, whooping cough and typhoid follow with rates of 9.8 and 5, respectively. The diphtheria rate was highest in Quebec (16), lowest in Nova Scotia (5); the whooping-cough rate highest in Nova Scotia (15), lowest in British Columbia and Prince Edward Island (2); the typhoid rate was highest in Quebec (10), lowest in British Columbia, Ontario and Saskatchewan (2).

So brief a review must obviously fail to do justice to a report which busied many men for many months in its preparation. In a few years we shall have a series of reports of sufficient length to enable us to compare periods rather than single years, when we shall appreciate even more than now the value of such documents. The reports already available should go far towards reconciling us to the task of writing death certificates. The question *"Cui bono?"* is answered. W.H.H.

Editorial Comments

The Discovery of Rickettsia-like Bodies in Rheumatic Carditis

Rheumatic fever has always remained a puzzle, notwithstanding much research on the subject. The view which at the present time seems to be the most generally accepted is that this disease is a low grade infection, due to a streptococcus which gains access to the body by way of the throat. The joint lesions may be due to the immediate local action of a generally disseminated germ or to sensitization of the arthritic tissues. That there is a substantial body of dissentients is proof that the problem is not solved, and, furthermore, that it is not simple. Any new light on the subject is, of course, welcome. In 1904, Aschoff broke new ground when he described peculiar cell aggregations in the heart, known since as "Aschoff bodies," which are constant and characteristic features of the disease. Within more recent times Aschoff bodies have been found in many other tissues and organs of the body in acute rheumatism. The wide distribution of these bodies suggests the operation of a generalized etiological agent, and their peculiar structure, unlike that found in most local reactions to bacterial agents, further suggests an infection of a peculiar kind, one that differs notably from most others.

Now we come to the announcement recently made* by J. Tertius Clarke and Mackenzie

* Clarke and Douglas, *Brit. M. J.*, 1931, **2**: 247.

Douglas, of the Ross Institute and Hospital for Tropical Diseases, who, in a preliminary communication, state that in eight cases of rheumatic fever they have found Rickettsia-like organisms associated with the Aschoff bodies. These organisms are present usually at the margin of the muscle bundles in swollen endothelial cells of capillaries and in fibrous-tissue cells. They are not seen in sections stained by hæmatoxylin-eosin or by the Gram method, but only in sections stained by the Leishman or Giemsa method. In colour they are red if the Giemsa stain is slightly decolorized, and purplish when stained by Leishman.

If these observations are corroborated we are in possession of a definite advance in our knowledge of acute rheumatism. It should be easy for trained microscopists to determine whether the bodies described by Clarke and Douglas are present or not in the Aschoff bodies. The chief difference is likely to arise over their identification, whether as some form of Rickettsia or merely as degeneration products. But this should not be very difficult for the experts to decide. The importance of the discovery, if confirmed, lies in the fact that rheumatic fever is taken out of the category of streptococcal infections and placed in the same group as typhus fever, trench fever, Rocky Mountain spotted fever, and some others. The profession will await with eagerness the further developments in this most important research, in which a new line of thought, as applied to a hitherto baffling disease, has been opened up. A.G.N.

The Death Rate Among Insured Canadians

The death rate among Canadian wage earners and their dependents runs about 9 per cent higher than for the comparable group in the United States.* This is due to the high death rates of Quebec, New Brunswick and Nova Scotia, but more especially Quebec. Two important and preventable diseases—tuberculosis and diphtheria—show an appreciably higher mortality in Canada, and the decline in this mortality has been rather small in recent years. On the other hand heart disease mortality which has risen very appreciably in the United States in recent years has not increased in Canada.

Deaths from violence are relatively fewer in Canada than in the United States and particularly so is this in the case of homicides. The death rate from this cause in Canada is less than one-ninth that of the United States. The larger coloured population there accounts for some of this great difference, but even if the comparison is made on the basis of white lives the homicide death rate in Canada is only about one-sixth that of the United States.

It may be pointed out here that the Metropolitan Life Insurance Company has about 1,250,000 Canadian industrial policy-holders and the mortality records of this large group afford a very good cross section of the whole population.

FRANK G. PEDLEY

* *Statistical Bulletin*, Metropolitan Life Insurance Company, June 12, 1931.

Prof. Herbert Stanley Birkett

Our readers will note with regret that owing to his having passed the age limit of the university Prof. Herbert Stanley Birkett, LL.D., or, to use the title conferred on him after the war, Brigadier-General Birkett, C.B., has resigned his connection with McGill University, a connection which began with his appointment as Demonstrator of Anatomy in 1889 and has just ended with his resignation of the Professorship of Oto-laryngology. This is a position which he has held with great credit for thirty-six years, during eight years of which he occupied the high position of Dean of its Medical Faculty. His career in the University has been in every way a notable one. The ability, good judgment, and exact knowledge shown in his own department of oto-laryngology gave him a reputation on both sides of the Atlantic. He has been honoured not only by his own faculty and the local profession but by the more important American and British Laryngological Societies and by several noted continental societies. His writings have been numerous and valuable, contributed not only to the higher class journals but also to several important treatises, both English and American. His war record was an important and brilliant one. Quite early in his medical career he took a keen interest in the Army Medical service, and, to fit himself for active duty, underwent a special course of training at Aldershot; so that before war occurred he had organized a volunteer army bearer corps. When the war did break out he immediately proferred his services to the university and through it to the War Office. The offer was promptly accepted and McGill was thus the first university to offer an army hospital unit completely equipped for service to the War Office. The many honours bestowed upon himself, his officers, and upon the corps itself are well known. His resignation will be a loss to the university, but we hope that his services both as a writer and as a consultant will be at the service of his confrères for many years to come. A.D.B.

The French Medical Review

The *French Medical Review* is an attempt to epitomize the work of our medical contemporaries in France. It is felt that, in spite of

all our modern methods of inter-communication, it is still the case that distant countries are really very little informed of the main movements of thought and scientific work in each other. Things filter through, of course, but often with considerable loss of time.

The originators of this review feel that they can help considerably in this scientific diffusion throughout North America, where, as they gracefully point out, the position of science is so high and worthily supported. The *Review* will appear ten times a year and will contain carefully chosen articles touching on modern clinical and experimental work in France. The articles will all be in English. General reviews will also be given on French work in physiology, chemistry, physics, bacteriology, etc.

The first number contains articles by Prof. Henri Roget, who discusses "The function of the lung in breaking up fatty substances"; by Prof. Léon Bernard, "On the arrest of early tuberculous infection"; and Prof. Lenormant on "The treatment of recurrent dislocation of the shoulder." These are followed by reports of the seventh National Tuberculosis Congress; the general meeting of the Society of Biology; notes from scientific societies; a few abstracts, and some book reviews.

We welcome this latest sprout amongst our already abundant medical foliage, and bespeak for it the attention of the Canadian medical profession.

H.E.M.

Special Articles

THE CLASSIFICATION OF THE HÆMORRHAGIC DIATHESES*

BY THEO. R. WAUGH, M.D.,
Montreal

The diseases which are characterized by a tendency to bleeding occupy a very broad field in pathology, and, grouped together, form a most interesting chapter in hæmatology. Their practical importance is felt in medicine and surgery alike. The combined efforts of physiologists, pathologists and workers in other branches of medical science have collected much knowledge regarding them but it would be optimistic to feel, even with the great mass of evidence at hand, that we are anywhere near a true scientific explanation of these lesions. With such lack of certainty regarding many of our present concepts, one hesitates to draw up a classification which must of necessity, as our knowledge increases, suffer alteration and modification. On the other hand, it is necessary for didactic purposes that the subject be approached in this way, for it is only by classifying the various diseases which comprise this group that the student may lay a foundation on which to base his views and later knowledge. We must sacrifice precision, as it were, for methodical teaching—keeping in mind, of course, the necessity of future revision as our concepts change.

DEFINITION OF HÆMORRHAGIC DIATHESIS

By the term "hæmorrhagic diathesis" we signify a symptom-complex characterized by a more or less generalized and persistent abnormal discharge of whole blood from the vascular channels. This may occur spontaneously, as in purpuric eruptions, or after trauma, as in prolonged bleeding from wounds. The term is not synonymous with any disease entity, but rather designates a syndrome met with in many diseases. Piney has defined the hæmorrhagic diatheses as a variety of morbid states which have in common a tendency to the occurrence of hæmorrhages, either in the form of petechial spots, purpuric extravasations, or ordinary loss of blood from free surfaces.

Quite recently there has been advanced considerable objection to the use of the term "diathesis" in this connection. The objections are based on the grounds that we thereby signify a generalized predisposition to the development of a specific disease process, which involves certain organic systems throughout their whole extent. While this is apparently the case as regards the blood and vascular system in most of the diseases included in this group, still others exhibit a multiple or plurifocal, but, in no sense generalized abnormality. As a matter of fact, similar objections may be raised to a great many terms employed in medical science, and in such cases long-continued usage and general acceptance should outweigh finer details of meaning in deciding upon their continuance or rejection.

ROUTINE TESTS FOR THE DETECTION OF THE HÆMORRHAGIC DIATHESIS

In order to demonstrate the presence of the diathesis in questionable cases, and to investigate and record its severity in recognized cases, a large series of tests have been devised. Of these the more important may be grouped into what constitutes a routine examination for such cases. The remaining, more specific tests are employed where specially indicated. The results derived from these tests are frequently of great diagnostic value in determining the nature and classification of each particular

* From the Pathological Institute, McGill University.

case. As they will be referred to frequently later, it would seem advisable to discuss them briefly here.

As a routine we determine the bleeding time, fibrin-formation time, congealing time with and without added calcium, enumerate the platelets, record the rapidity and extent of clot retraction and the effects of prolonged stasis in the arm, and, if the blood is not studied otherwise from the morphological standpoint, examine a moist cover slip preparation to observe any gross abnormalities in the cell content. The bleeding time is determined by the method of Duke, which consists in puncturing the lobe of the ear to a depth of about 4 mm. and removing every half minute the drops which form by gently touching them with a filter paper. Bleeding should cease in about three minutes. It is important to use the ear, as the finger in workmen with toughened skin will frequently not show an abnormality which is present. As a matter of fact, actual timing of the test is not necessary in routine work as one is soon able to determine from experience when the bleeding is appreciably prolonged.

Three tests are employed to determine the coagulability of the blood. These are the fibrin-formation and the congealing with and without the presence of added calcium chloride. It is important to point out here that a great deal of the discrepancy which exists in reports on blood coagulability arises from lack of cognizance of the difference between fibrin formation and congealing of the blood. In many conditions fibrin may form rapidly and still congealing of the blood be delayed, so it is essential to recognize the difference and not group them together as identical tests for blood coagulability. It is not within the scope of this paper to go into the theoretical details of coagulation, but it is important in this connection to bear in mind that we must distinguish an initial stage which ends with the first formation of fibrin from a middle stage which ends with the solidification of the blood into a gel. The third and final stage is concerned with retraction of the clot and expression of the blood serum.

Several of the recognized tests for coagulability measure only the first stage and have for their end-point the formation of fibrin. Such are the methods of Bürker, Brodie and Russel, and the capillary tube test of Wright. We have employed a modification of the Bürker method for some time with satisfactory results. Two points should be kept in mind in performing all of these tests;—first, the temperature should be carefully controlled, and secondly, if the blood is obtained by a stab wound from the finger or ear, not the least pressure should be brought to bear on the part. A good clear flow of blood is essential, as expressed tissue juices greatly accelerate the reaction.

The congealing time is determined by taking blood from the vein in a carefully dried syringe and placing 1 c.c. in a Wassermann tube, which is carefully tilted every half minute until it may be inverted without the blood altering its position. This is the end-point. Here again a fairly fixed temperature is essential for accurate results, though in routine work ordinary room temperature is sufficient. As a modification of this test an additional tube containing six drops of 0.5 per cent aqueous solution of calcium chloride is employed. To this 1 c.c. of venous blood is added and the time of complete congealing noted. Normally, congealing is complete in 7 minutes in the first tube and 9 minutes in the tube containing calcium. The theory has been advanced that the blood normally contains an optimum amount of calcium and too much retards coagulation. It is rather difficult, however, to accept this. The test gives us a ready means of demonstrating a deficiency of the so-called available calcium met with in certain conditions, particularly obstructive jaundice.

For retraction of the clot it is better to employ a watch-glass, or at least a pointed test tube, as often normal blood will not show retraction of the clot if an ordinary round-bottom test tube is used. This is particularly true where the corpuscle volume is high. The dependence of this stage of coagulation upon the blood platelets is quite generally accepted.

Enumeration of the platelets may be carried out by various methods, most of which show a normal figure of about 300,000, in spite of the fact that some observers maintain that this figure is much too low. We use a modification of the method of Spitz, which is accurate and not nearly so tedious as the much employed method of Fonio. Here again it is prerequisite to obtain a good flow of blood and avoid delay in diluting the measuring blood column.

Finally, any evidence of the development of petechial hæmorrhages in the skin of the forearm after venous stasis for ten minutes are noted. This is often referred to as the Rumpel-Leede test, and should be recorded in all cases of hæmorrhagic diathesis.

Many other tests, which go into the finer details of blood coagulability, have been devised and should be employed where a more thorough study is required. Such are the prothrombin test, estimation of fibrinogen content of the plasma, and so forth. The group outlined above, however, is sufficient in most cases for diagnostic purposes.

FACTORS CONCERNED IN THE PRODUCTION OF THE HÆMORRHAGIC DIATHESES

Unfortunately, the finer details of the exact mechanism of the cessation of hæmorrhage are not exactly known. However, it is quite clearly established that in the process we have to consider three main factors: first, the coagula-

tion of the blood; secondly, the action of the platelets in forming a thrombotic plug; and thirdly, purely vascular phenomena which are apparently quite independent of the composition of the blood itself. These three factors form, as it were, a triad, on which must of necessity rest all discussion and theoretical conceptions of the subject.

For many years the coagulation of the blood was considered by far the most important of these factors. Attention was naturally first directed to this. However, as more evidence accumulated, it became obvious that cases often showed definite prolongation of fibrin formation without prolongation of the bleeding time, as for example, some cases of hæmophilia and in certain stages of obstructive jaundice. The shift of view then became so marked that some authors were inclined to disregard coagulation as a factor in checking hæmorrhage. This is undoubtedly going too far, for we now know that if coagulability is markedly delayed or absent, as may be demonstrated by certain poisonings, bleeding is sure to be prolonged. At least the initial stage of blood coagulation is essential for the cessation of hæmorrhage.

Through the study of cases particularly, the inter-relation between deficiency in platelets and prolonged bleeding has been definitely established. The thrombotic plug which holds back the flow in the incised vessel is formed through the agglutination of platelets. It has been demonstrated that the head of the plug is microscopically free from fibrin, but nevertheless numerous observations have shown that this agglutination of the platelets is in some way bound up with coagulation, and in the absence of clotting, clumping of the platelets does not occur.

Interesting in this connection are the findings in cases of hæmophilia, where coagulation is not absent but slowed. In these cases bleeding time, as tested by the puncture needle, may not be prolonged, while cutting of larger vessels gives rise to persistent, often fatal hæmorrhage. This is explained by Frank on the grounds that while the slow coagulation allows for the formation of an accumulation of platelets sufficient to plug capillaries, the thrombus is not properly constituted to check the flow from large vessels, where the *vis a tergo* of the blood has appreciable pressure. Recently, however, there has been an accumulation of evidence which shows that these two factors alone cannot explain all the phenomena associated with bleeding. Discrepancies between the number of platelets and bleeding time undoubtedly occur. This was well illustrated in a case of essential thrombocytopenia which I followed over a period of about three years before splenectomy was performed. This patient had several acute attacks of spontaneous bleeding, but in the intervals between, when all symptoms had disappeared, on frequent examinations the platelets were as low or even lower than during the exacerbations, yet only slight prolongation of the bleeding time then occurred. Moreover, in a number of well-recognized conditions, such as scurvy, Schönlein-Henoch purpura, etc., at certain times neither microscopic, clinical, nor physical examination of the blood shows evidence of abnormality.

We have therefore been forced to recognize a third factor, which is purely vascular—a mechanism of the blood vessels themselves which plays an important rôle in the phenomenon. Some attribute these changes to alteration in the cement substance which binds together the endothelial cells of the vessel wall, others to injury of the lining cells themselves, whereby they are not prepared for the attachment of platelet masses, again to changes of the elasticity of the vessel wall, and still others, such as Ricker, place greatest weight upon abnormal influences of vessel innervation whereby the normal contractility is disturbed. The importance of the innervation in the mechanism of living events deserves, perhaps, greater consideration than has been accorded to it in the past. It is most probable that we are dealing with a combination of various phenomena, which in the paucity of our knowledge we must for the present, at least, group together until further evidence allows for finer and more correct analysis.

To summarize, therefore, we find that the cessation of hæmorrhage is due to the interplay of the three factors outlined above; each is to a degree essential, but at the same time a deficiency in each may be compensated for by the others. Then the process is altered to a greater or lesser extent but stasis occurs nevertheless. In a sense the situation is analogous to our present conceptions of the interrelation of sunlight, vitamines, and salts in bone formation. If we bear these facts in mind, the difficulties which must of necessity arise in an analysis of the pathological changes occurring in any specific hæmorrhagic diathesis become more obvious, and it is lack of appreciation of these difficulties and complications which has led to the formulation of many false theories in the past.

CLASSIFICATION OF THE HÆMORRHAGIC DIATHESES

When we turn to the classification of the hæmorrhagic diatheses, it is only natural that this should be built up as far as possible upon the triad outlined above. Here again, however, it should be borne in mind that interplay of the factors often makes positive separation into groups very difficult, and any classification must be accepted in the light of present conceptions and subject to future alterations. We

therefore recognize three great groups into which these conditions are divided: first, those characterized by alteration in the coagulability of the blood with no marked reduction of platelets; secondly, those in which there is marked thrombocytopenia—that is, figures below 30,000 (which has been established as the critical point); and thirdly, those conditions showing normal blood findings, at least as far as hæmorrhagic factors are concerned. In the first group we further recognize subdivisions according as the interference with coagulation is due to abnormality in the various factors concerned with blood clotting. Here we include hæmophilia, the hæmorrhagic diathesis associated with jaundice, certain toxic and septic states associated with marked destruction of liver parenchyma, and those abnormalities characterized by a deficiency in fibrinogen.

As regards hæmophilia we are still, after a tremendous amount of research on the subject by innumerable investigators, not certain as to its exact nature and cause. It is beyond the scope of this paper to go into the various theories on the subject; let it suffice to state that the present balance of evidence is in favour of its being a sex-bound recessive inheritable disease characterized by a slowing of blood coagulation. This interference with coagulation is apparently due to abnormality in one of the factors concerned with the production of thrombin. There is no deficiency in fibrinogen; platelets occur in normal number; and once the clot has formed it retracts with the expression of serum containing active thrombin. As stated above, in some cases superficial wounds involving merely the capillary bed may not show prolonged bleeding time, but the cutting of larger vascular channels is accompanied by prolonged, even fatal, hæmorrhage. The disease occurs apparently exclusively in males, tends to vary greatly in severity in different cases, and to ameliorate as adult life is reached. Interesting from the biological standpoint is the theoretical possibility of the disease being manifest in the female, provided she is the daughter of a male bleeder and a woman who is the bearer of the recessive characteristic. Probably, however, such female hæmophiliacs do not occur. This may be explained, as Bauer suggests, by the fact that such a combination is not compatible with life.

The tendency to hæmorrhage associated with jaundice is a most interesting subject, which can only be touched upon here. It has been held for a long time that this is due to a deficiency in "available" calcium. By that is meant that while the blood calcium is normal in quantity, it is not in combination to act normally in the coagulation process. Certainly, as I have repeatedly found on numerous examinations, the addition of calcium chloride—that is, the congealing with calcium test—accelerates the clotting process, though it may not bring it to normal figures. This is, of course, not the complete explanation of the phenomenon. It was thought for some time that the change was due to the increase in bile acids, but we now realize that they do not reach a figure sufficient to cause such an interference. Delayed fibrin formation and congealing often precede for some time the development of a definitely prolonged bleeding time, which, however, later becomes manifest. Moreover, the severity of the hæmorrhagic diathesis does not stand in direct relation to the intensity of the jaundice, but rather, it would seem, to its duration, this leads one to suspect damage to the liver parenchyma as an important factor, though fibrinogen content of the blood may not be disturbed.

Finally in this group, under the term "fibrinopenia", we include those disturbances in which deficiency of the fibrinogen content of the blood is the outstanding feature. Some are idiopathic, others due to organic disease of the liver, such as acute yellow atrophy, extensive tuberculosis, etc., but the majority are the result of poisonings such as from phosphorus or chloroform.

The second main group of the hæmorrhagic diatheses includes all those conditions with marked thrombocytopenia,—that is, in which the platelets drop below 30,000 per c.mm. These may be further divided into two sub-groups: first, the essential idiopathic thrombocytopenia; and second, the symptomatic thrombocytopenias, in which the drop in platelets occurs merely in the course of some other recognized disease. While a hard and fast rule cannot be laid down, in a general way it holds that in marked deficiency in platelets the bleeding time is prolonged, congealing is delayed, and clot retraction is poor or absent, while fibrin formation is normal or even rapid. This acceleration of fibrin formation seems to bear a relation to the blood loss, being more rapid after severe hæmorrhage. Possibly this is due to flooding of the blood by tissue fluids to restore the depleted blood volume after hæmorrhage occurs.

Essential thrombocytopenia, or Werlhof's purpura, is a chronic insidious disease with acute, sometimes fatal, exacerbations, and is characterized by a more or less persistent decrease in platelets. Probably the purely acute forms which have been described are either merely exacerbations of an unrecognized chronic type or infections or anaphylactoid diseases. The precise cause of the platelet deficiency is still uncertain. There are various theories, but two stand out particularly: first, that of Kaznelson, and secondly, Frank's. Kaznelson attributes the deficiency to an increased and abnormally active destruction of the platelets in the spleen. This led him to perform the first

splenectomy, with the usual result that bleeding stopped with extraordinary rapidity and the platelet count rose. He reported the finding of large masses of platelets and detritus from disintegrated forms in the organ. This has been confirmed in some cases but is not present in the vast majority. I have never observed it in several different specimens.

The presence of very large atypical platelets in the circulatory blood in this disease early attracted attention to the possibility that the primary cause lay in an abnormality in the formation of thrombocytes. This was more or less substantiated by Frank and others through histological studies of the megakaryocytes of the bone-marrow. While present in at least considerable, if not normal, numbers, these giant cells showed irregular nuclear changes and failure of normal formation of pseudopodia.

Interesting as these findings are, we are far from the solution of this problem, a solution which very possibly is much simpler than we suppose. The changes following splenectomy are not specific for this disease, but occur after splenectomy of the normal organ, as I was able to demonstrate recently in a case in which the spleen was removed because of adhesions to a cancerous splenic flexure of the colon. Personally, I now look upon the beneficial effects of splenectomy in this condition as due to quite independent changes, which fortunately tend to correct the abnormalities which are present but in no way strike at the root of the disease. Moreover, while one cannot deny the histological abnormality of the megakaryocytes, the rapid production of platelets following excision of the spleen precludes any conception of more than a very simple injury or, perhaps better, inhibition.

Many phenomena associated with this disease, such as the cessation of bleeding on clamping the splenic artery and before the platelets have risen above the critical level, and remissions during which the platelets remain very low, all point to vascular factors likewise playing a rôle in the symptom-complex. It would seem, however, to be going too far to disregard the platelet deficiency, as some have done, in attempting to explain this hæmorrhagic diathesis.

The symptomatic thrombocytopenias are much more common than the essential form. They occur in the course of a great number and variety of conditions. These are principally the acute infectious diseases, such as diphtheria, scarlet fever, smallpox, typhoid, etc.; severe sepsis from various organisms; many of the so-called primary blood diseases, such as pernicious anæmia and the leukoses, particularly of the acute type; conditions in which the bone-marrow is replaced by other tissues, as in extensive carcinoma, lymphogranulomatosis, Gaucher and Neuman-Pick diseases, osteosclerosis and "marble" bones; chemical poisonings, as from salvarsan or benzol, and a variety of myelotoxic conditions characterized by a reduction in the circulatory myeloid elements of the blood. The last are called, according to the severity and specific action of the irritant upon the bone-marrow, agranulocytosis, aleukia hæmorrhagica, aplastic anæmia and panmyelotoxicosis.

We attribute these symptomatic thrombocytopenias to the deleterious effect of various agents upon the megakaryocytes of the bone-marrow. Such a view is supported by histological evidence. That vascular factors play a rôle in the prolonged bleeding in many of these conditions is, however, quite obvious.

There should be mentioned here an extraordinary condition, first described by Glanzmann and since confirmed by other observers. This is called hereditary thrombasthenia and is characterized by the fact that while the platelets are present in large numbers, they are inactive and hence the typical symptom complex of thrombocytopenia is produced. They do not agglutinate, as is obvious from the blood smear, but often are abnormal in size, shape and staining properties. The disease has been followed through several generations.

Finally, in the third group of the hæmorrhagic diatheses we have to do with conditions in which the coagulability of the blood and the number and activity of the platelets are normal, but in which a vascular dysfunction stands out as of paramount importance. This abnormality of the blood channels was met with to a greater or lesser degree in the previous groups, but nevertheless the alteration of the blood itself is still considered by most observers as of controlling importance in the pathogenesis of those conditions. On the other hand, here vascular phenomena control the picture and the hæmorrhagic diathesis must be explained through them. As stated above, our knowledge of the precise nature of these vascular abnormalities is too meagre to more than theorize on the mechanism of their pathogenesis. Apparently they are not all identical, but evidently, as shown by special tests, such as the orthostatic position, stasis of blood in a part, and manual irritation, they are of vascular nature. We recognize two distinct types, one in which the extravasations are of pure blood and the other in which they are combined with exudative inflammatory changes. The outstanding conditions which fall into this group are scurvy, Barlow's disease, and the Schönlein-Henoch purpuras, the status varicosus of Osler and the symptomatic changes in numerous infectious diseases such as subacute bacterial endocarditis.

In scurvy the Rumpel-Leede test is nearly

always positive and bleeding time may be prolonged. In severe cases there are associated changes in the bone-marrow with severe anæmia and interference with myeloid activity. These are not necessary, however, for the development of the disease picture and the blood may be essentially normal, as I have observed in several cases. Similarly, in the infantile scurvy it is not uncommon to find the marrow aplastic and fibrous.

In Schönlein's disease the purpuric spots tend to appear in crops, with swelling of the joints and œdema, while in Henoch's purpura there are marked gastro-intestinal symptoms with bleeding from the bowel. The purpuric eruptions in the skin often occur at this time. Here also blood changes may occur. The similarity in many aspects to serum sickness has led to their association with anaphylactic phenomena.

In status varicosus we face an inherited constitutional deficiency of the venous channels which first makes its appearance as phlebectasia at the time of puberty, and may be accompanied by considerable loss of blood leading to severe and even fatal post-hæmorrhagic anæmia. It is a familial disease, eleven cases having been reported in one family by Goldstein.

The presence of endothelial cells in the circulating blood of cases of endocarditis lenta, particularly after massage of the part from which the blood was taken, supports the view that in this disease we are dealing with an actual alteration in the lining cells of the vessels. The sharp separation of the septic conditions in this group of vascular diatheses from those showing abnormalities of the blood, however, can not be made as many sooner or later show distinct alteration of myeloid function.

In conclusion, one cannot over-emphasize the importance of keeping clearly in mind in all the hæmorrhagic diatheses the interplay of the various factors concerned in the control of bleeding. As stated above, coagulation of the blood, thrombus formation by the platelets, and certain vascular changes are all to a degree prerequisite for the cessation of hæmorrhage but deficiencies in one may apparently under certain conditions be compensated for by the others. This interplay often tends to make the results of the various tests employed for the differential diagnosis of these diseases most confusing. But as knowledge increases the causes of these discrepancies are certainly being brought to light.

I have attempted above to formulate a classification, which would be primarily of didactic value. Over-emphasis may have been placed upon some distinguishing points in the separation of the various divisions. This is necessary, however, for the obvious features must form the basis of any method of classification at the present time.

Men and Books

THE MEDICAL HISTORY OF BRITISH COLUMBIA*

BY A. S. MONRO, M.D.,

Vancouver

The medical history of British Columbia lends itself, both chronologically and in development, to a natural division into three periods:— (1) The period of exploration and of the fur traders. This takes us from the landing of Captain Cook at Nootka, 1778, to 1849 when Vancouver Island became a Crown Colony under Governor Blanshard. (2) The period of the gold discoveries in Cariboo and other districts, 1850 to 1884. This period includes the formation of the Crown Colony of British Columbia, the union of the two Crown Colonies into the united colony of British Columbia, 1858, and also the entrance of British Columbia into the Confederation of Canadian Provinces in 1871. (3) The period of the railway and modern transportation, 1882 to present date. In the first period, half a dozen men will fill the picture, each one, for the time, practically the sole representative of the profession in the country.

To Dr. John Sebastian Helmcken goes the undisputed honour of being the first white medical practitioner in British Columbia. His arrival in the infant colony of Vancouver Island was in 1850, and his advent marks the end of the period of the fur traders. It is well to bear in mind that up to 1846 the British, through the Hudson's Bay Company, held sway in that vast territory bounded on the east by the Rockies, on the south by California, on the north by Alaska and on the west by the Pacific Ocean. Under the Hudson's Bay Company, this vast domain, comprising the present States of Oregon and Washington and the Province of British Columbia, was known as the "District of the Columbia". It was administered most ably for more than twenty years by a medical man, Dr. John McLoughlin, a native of Canada. Associ-

* The following authorities and works of reference have been used in preparing this history. "Captain James Cook's Voyages Around the World"; "Menzies' Journal of Vancouver's Voyage", April to October, 1792, Editor, C. F. Newcombe, M.D.; "The Conquest of the Great Northwest", by Agnes C. Laut; "McLoughlin and Old Oregon", a chronicle by Eva Emery Dye; "Vancouver's Discovery of Puget Sound", by Edmund S. Meaney, Prof. of History, University of Washington; "British Columbia", by E. O. S. Scholefield.

ated with him was Dr. William Fraser Tolmie, father of the present Premier of British Columbia. While the work of these men was largely administrative in character, yet both, in times of stress and need, contributed their quota of medical skill to the needs of the community, supplementing the work of the medical men employed by the Company to care for the medical wants of their people.

Before the period marking the era of the great fur company, there were the various British and Spanish exploring expeditions, attached to which were several notable surgeons. A study of the work of these men and a short account of the various expeditions will add interest to the story before touching more fully upon the life and work of Dr. J. S. Helmcken and the men who followed him. From the time of Cortez, the conqueror of Mexico (1520), the exploration of the west coast of North America became a matter of supreme importance, not only to the Spanish but to other nations then active in re-mapping of the world. The explorations carried out under the direction of Cortez resulted in the discovery of Lower California, but by the end of the 16th century (1590), Spanish enterprise dwindled, and practically nothing was done to add to the knowledge of the coast northward from California until 1765. Stimulated by the conquest of French Canada (1763), de Croix, Viceroy of Mexico, launched a very definite policy of expansion. The first Spanish keel to ply the north Pacific was the little corvette *Santiago* which sailed from San Blas, January 1774, in command of Don Juan Perez. The navigating officer was Estevan Martinez whose name is commemorated in Point Estevan on the southwest coast of Vancouver Island, a landmark for navigators on their way to the Orient.

Two expeditions followed shortly in the wake of the *Santiago*. Being recommissioned, she was placed in command of Naval Lieutenant Don Bruno Heceta. Her consort was the little schooner *Felicidad*, re-named the *Senora*, under Lieutenant Juan Francisco de Bodega y Quadra. The vessels sailed from San Blas, March, 1775. On July 11th, the northwest coast was sighted in latitude 48 degrees and 26 minutes, from which the Spaniards searched southward in vain for the entrance to the Straits of Juan de Fuca. They anchored near Point Grenville. Here, on this point, July 14, 1775, so far as is known, Europeans first set foot on the northwest coast. Bruno Heceta, the padre, Pierre, the surgeon, and the second pilot, landed with a few sailors and after erecting a cross with due ceremony, took possession of the country in the name of the King of Spain. While this ceremony was being carried out, a large number of the crew of the *Senora* who had landed, were killed by a band of three hundred Indians who fell upon them without warning. Following this tragic event the ships parted company, Heceta continuing on his northward course to near the 50th parallel and touching on the west coast of Vancouver Island. He now decided to retrace his steps and turned southward, reaching Monterey, August 30th, with two-thirds of his men disabled by scurvy.

Quadra, on the *Senora*, a little vessel 27 feet in length, undermanned, made a desperate attempt to reach the 65th parallel. However the task was too much for him and when in the neighbourhood of the 50th parallel he turned his ship around and finally reached San Blas in November 1775, after an absence of eight months. The name of Heceta is preserved on the Admiralty Maps in Heceta Straits. For half a century Vancouver Island bore the dual title of the Island of Vancouver and Quadra.

When Captain James Cook sailed from Plymouth, July 12, 1776, on his third and last voyage of exploration and discovery to the Pacific, he had with him as surgeon on the ship *Resolution*, Mr. William Anderson, a young man of high scientific ability, who was the naturalist and ethnologist of the expedition.

Capt. Cook in his journal states: "The department of natural history was assigned to Mr. Anderson, the surgeon of the *Resolution*, who was as willing as he was well qualified to describe everything in that branch of science which should occur worthy of notice." From the remarks of this gentleman Capt. Cook had derived considerable assistance in his last voyage, especially with regard to the copious vocabulary of the language of Otaheite and the comparative specimens of the language of the other islands which had then been visited. Capt. Cook, while in Adventure Bay, Van Dieman's Land, refers to Anderson's observations on the natural productions and the inhabitants of the country.

Voyaging northward, Capt. Cook stopped at various islands, and he records in his journal the interesting observations made by Mr. Anderson on the customs and habits of the natives, their language, religion, etc.

On March 7, 1778, the long-looked-for coast of New Albion was sighted, and on the 29th of March the captain came to an anchor in an inlet now known as Nootka. In his journal is a detailed description of snow-covered mountains, the valleys with their forests of high, straight trees, the wild birds and animals, the climate, etc., for which he gives Mr. Anderson due credit. The natives were not shy, and regular visiting between shore and ship soon took place. He notes that while most of them were honest in their dealings, yet there were many who were not: they would steal anything they could lay their hands on. They were particularly keen to trade their wares for

anything made of metal, especially brass.. As a result of their thieving propensities whole suits of clothes were stripped of their buttons; bureaux were deprived of their knobs, copper kettles, tin canisters, candlesticks and whatever of the like could be found, all went to wreck; so that "these Americans became possessed of a greater medley and variety of things from our people than any other nation that had been visited in the course of the voyage."

Of all the uncivilized tribes which our commander had met with in his several navigations, he never found any who had such strict notions of their right to the exclusive property of everything in their country, as did the inhabitants of the Sound where he was now stationed. "At first they wanted to be paid for the wood and water that were carried on board; and had the captain been upon the spot when these demands were made, he would certainly have complied with them; but the workmen in his absence, maintained a different opinion, and refused to submit to any such claims. When some grass, which appeared to be of no use to the natives, was wanted to be cut, as food for the few goats and sheep which still remained on board, they insisted that it should be purchased, and were very unreasonable in their terms; notwithstanding which, Captain Cook consented to gratify them as far as he was able. It was always a sacred rule with him never to take any of the property of the people whom he visited without making them ample compensation.

"With respect to the inhabitants of the country, their persons are generally under the common stature, but not slender in proportion, being usually pretty full or plump, though without being muscular. From their bringing to sale human skulls and bones, it must justly be inferred that they treat their enemies with a degree of brutal cruelty; notwithstanding which, it does not follow that they are to be reproached with any charge of peculiar inhumanity, for the circumstances now mentioned only marks a general agreement of character with that of almost every tribe of uncivilized men in every age, and in every part of the globe. Our navigators had no reason to complain of the disposition of the natives, who appeared to be a docile, courteous, good-natured people—rather phlegmatic in the usual caste of their tempers, but quick in resenting what they apprehend to be an injury and easily permitting their anger to subside. Their other passions, and especially their curiosity, seemed to lie in some measure dormant, one cause of which may be found in the indolence that for the most part is prevalent amongst them. The chief employments of the men are those of fishing and of killing land or sea animals for the sustenance of their families, while the women are occupied in manufacturing their flaxen or woollen garments, or in other domestic offices. It must be mentioned to their honour that they were always properly clothed and behaved with the utmost decorum, justly deserving all commendation for a bashfulness and modesty becoming their sex; and this was the more meritorious in them, as the male inhabitants discovered no sense of shame. In their manufactures and mechanic arts, these people have arrived at a greater degree of extent and ingenuity both with regard to the design and the execution, than could have been expected from their natural disposition, and the little progress to which they have arrived in general civilization. Their dexterity in particular with respect to works of wood must principally be ascribed to the assistance they receive from iron tools, which are in universal use amongst them, and in the application of which they are very dexterous. Whence they have derived their knowledge of iron was a matter of speculation with Captain Cook. The most probable opinion is that this and other metals had been introduced by way of Hudson's Bay and Canada, and thus successively had been conveyed across the continent from tribe to tribe. Nor is it unreasonable to suppose that these metals may sometimes be brought in the same manner from the northwestern parts of Mexico. The language of Nootka is by no means harsh or disagreeable, for it abounds, upon the whole, rather with what may be called labial and dental than with gutteral sounds." A large vocabulary of it was collected by Mr. Anderson.

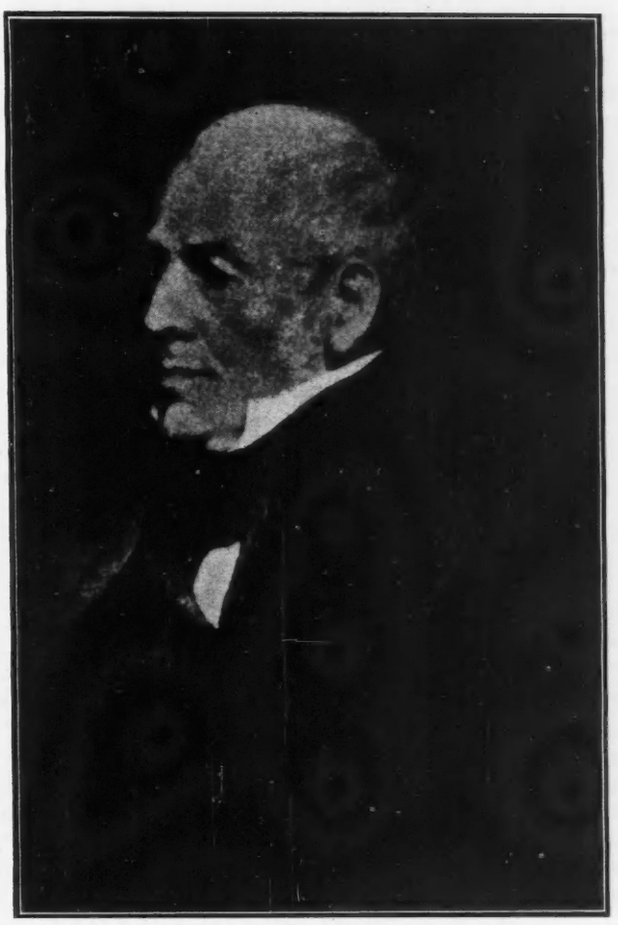
On April 26th, having completed repairs to the ship, Capt. Cook set sail from Nootka and proceeded on his way northward. Early in August the expedition had reached Behring Sea and here in his journal, Capt. Cook recounts the loss sustained in the death of Mr. Anderson.

"When our navigators, on the 3rd of August, had advanced to the latitude of 62 deg. 35 min., a great loss was sustained by them in the death of Mr. Anderson, the surgeon of the *Resolution*, who had been lingering under a consumption for more than twelve months. He was a young man of a cultivated understanding and agreeable manners, and well skilled in his own profession; besides which, he had acquired a considerable degree of knowledge in other branches of science. How useful an assistant he was to Capt. Cook has often appeared in the present narrative. Had his life been spared, the public would undoubtedly have received from him such communications on various parts of the natural history of the several places that had been visited, as would justly have entitled him to very high commendation." The proofs of his abilities that now remain will hand down the name of Anderson, in conjunction with that of

Cook, to posterity. Soon after he had breathed his last, land having been seen at a distance, which was supposed to be an island, our commander honoured it with the appellation of Anderson's Island. The next day he removed Mr. Law, the surgeon of the *Discovery*, into the *Resolution*, and appointed Mr. Samwell, the surgeon's first mate of the *Resolution* to be surgeon of the *Discovery*."

THE MARITIME FUR TRADERS

The latter half of the eighteenth century, like that of the sixteenth, exhibited great enterprise in the extension of trade to the distant and then little known parts of the world; but unlike the earlier period, when the eyes of the great merchant adventurers of England were turned almost entirely to the eastern shores of North America and the discovery of a northwest passage to India, attention had become centred upon the more recently discovered islands of the South Pacific and the valuable fur trade carried on between China and the storm and mist-bound coasts of northwestern America.



Archibald Menzies. From the painting by Eddis in the Linnean Society, London.

Before Captain Cooke's expedition returned to England, war had been declared between Great Britain and France and Spain. It was not considered, therefore, an opportune time for the publication of the results of the voyage. The war was brought to a close by the Treaty of Versailles, 1783, but it was not, however, until the official account of Cook's third and last voyage appeared in 1784 that the new field for commercial enterprise attracted world-wide attention. Nootka became the centre of the new fur trade and numerous ships, manned by adventurers, principally British and American, came to share in the spoils. A keen rivalry arose between the various claimants for supremacy at Nootka, and to forestall any move on the part of the Russians, who it was reported were sending four frigates to establish a post there, Florez, Viceroy of Mexico, despatched two vessels, the *Princessa* and the *San Carlos*, in February, 1789, in command of Martinez, with Haro second in authority, to Nootka, where on June 24th, formal possession was taken of the Port with all the pomp and ceremony the Spaniard loves so well.

Trouble soon followed. Martinez seized some British ships and sent them as prizes to Mexico. Their crews were sent with them and the complaints of the harsh treatment they received at the hands of the Spanish soon reached Britain. Public feeling ran high in England, and Pitt, who was Prime Minister, demanded immediate satisfaction from Spain. Preparations were made for war and it was only averted by the signing of the Nootka Sound Convention by King Carlos IV, October 28, 1790.

To the world at large this treaty was the first external evidence of the ebb of the tide, the beginning of the collapse of the Spanish Colonial system. It was the express renunciation of Spain's ancient claim to exclusive sovereignty, navigation, commerce and fisheries on the Pacific coast of America. The Nootka dispute was no sooner settled than the British Government again turned its attention to the affairs of western America.

Captain George Vancouver was given command of the expedition, and two ships, the *Discovery* and *Chatham*, were assigned by the Admiralty for this purpose. In accordance with the terms of the Nootka Convention, Vancouver was clothed with authority to receive from the Spanish officer he was to meet at Nootka the lands and houses that Meares, the British trader, claimed had been wrested from him in May, 1789. He was also to explore the northwest coast of America between the parallels of 30 and 60 degrees, north latitude. The *Chatham* and *Discovery* sailed from Falmouth, April 1, 1791, and after rounding the Horn sighted the coast of New Albion on the 17th of April, 1792. On April 29th, the two vessels sailed into the Straits of Juan de Fuca and thence on through the

Gulf of Georgia, coming to anchor near Point Grey, now a suburb of the City of Vancouver. It was here that he fell in with two little Spanish vessels, the *Sutil* and *Mexicana,* commanded respectively by Don Dionisio Galiano and Don Cayetano Valdez. These vessels proved to be a detachment from the expedition of Malaspina, then in the service of Spain. Galiano and Valdez had entered the Strait five days after the British expedition and since that time had been engaged in examining the coast partly surveyed by Spanish officers in previous years. Almost the first news imparted to Vancouver was that Bodega y Quadra, the commandant of San Blas in California, was awaiting the arrival of the British commissioner at Nootka in order to restore the disputed territory to the Crown of Great Britain in accordance with the terms of the Nootka Convention.

Having taken on board Louis Galvez, the surgeon of the frigate *Aranzaza,* the *Sutil* and *Mexicana* sailed for the Straits of Fuca and a few days later came to anchor at the port of Nunez Gaona, now known as Neah Bay, to which place the Spaniards had determined to transfer the settlement of Nootka, in anticipation of the surrender of that port to the British.

The work of exploration was carried on by both Spanish and British and they frequently compared notes and charts. On August 28th, Vancouver made Friendly Cove (Nootka) and was piloted to an anchorage by a Spanish officer. The Spanish flag was saluted by the British vessels while the guns from the Port echoed the martial salutation. Vancouver, accompanied by some of his officers, then called upon Bodega y Quadra, who received the party with the greatest cordiality. The meeting was historic, inasmuch as never before had the ships of the Royal Navies of Great Britain and Spain exchanged courtesies on the northwest Coast. Moreover the two commanders, Vancouver and Bodega y Quadra, had been authorized by their respective governments to give effect to the terms of the Nootka Convention, of which Treaty it may be truly said that it marked a turning point in the history of northwestern America.

Leaving Vancouver and Quadra to their negotiations, which were carried on for several weeks and then not completed, we shall now turn our attention to the medical men of the *Discovery* and *Chatham.* While at Nootka, Capt. Vancouver took the opportunity of sending Surgeon Cranstoun of the *Discovery,* who had been ill a long time, back to England by a vessel leaving for Port Jackson, New South Wales, and replacing him with Archibald Menzies. Vancouver records the incident as follows:—

"Mr. Cranstoun, the surgeon of the *Discovery,* having been rendered incapable of his duty by a general debilitated state of health since our departure from the Cape of Good Hope, requested permission to proceed to Port Jackson in the *Daedalus,* from whence he might soon procure a passage to England; he was consequently discharged on September 8, 1792, and Mr. Archibald Menzies, a surgeon in the navy, who had embarked in pursuit of botanical information, having cheerfully rendered his serivces during Mr. Cranstoun's indisposition, and finding that such attention had not interfered with the other objects of his pursuit, I considered him the most proper person to be appointed in the room of Mr. Cranstoun."

ARCHIBALD MENZIES
Surgeon and Naturalist

To many readers he will prove the most attractive and interesting member of the entire expedition. He was the naturalist. At the present time students, especially of botany, in the western portion of America are familiar with his name, though few of them have taken the trouble to learn about the man. How many men, women and children have admired the Madrona tree of the western forests! Bret Harte has sung its beauties in a poem concluding with this stanza:

"Where, oh, where shall he begin
Who would paint thee, Harlequin?
With thy waxen burnished leaf,
With thy branches' red relief,
With thy polytinted fruit,—
In thy spring or autumn suit,—
Where begin, and oh, where end,
Thou whose charms all art transcend?"

Ask a botanist the name of this beautiful tree, and he will tell you it is *Arbutus menziesii,* and then, if he loves the work, his face will lighten up as he adds, "That name is in honour of Archibald Menzies, the naturalist of the Vancouver expedition, who discovered this and many other plants on our western shores."

Archibald Menzies, Scottish botanist, explorer, and traveller, was born at Stix or Styx, an old branch house of the Menzies of Culdares about four miles west from Aberfeldy, Perthshire, Scotland, and was educated at Weem Parish School. According to the Weem Kirk register, he was baptized on March 15, 1754. It is remarkable that nearly all the Menzies in the vicinity of Castle Menzies were either gardeners or botanists; an old record of proceedings shows that no fewer than seven of this name were employed at the same time at the Castle gardens.

His elder brother William, got him a place with him as a gardener in the Edinburgh Botanical Garden. Dr. John Hope, professor of botany, helped the young man get the training for a surgeon at the University. He made a botanical tour through the Highlands and the

Hebrides in 1778, and then became assistant to a surgeon at Carnarvon. He entered the navy as assistant surgeon on the *Nonsuch,* under Captain Truscott, and was present with Rodney's fleet at the victory over the Comte de Grasse on April 12, 1782. He was serving on the Halifax station after the peace until 1786, when he was engaged as surgeon on board the *Prince of Wales,* under Lieutenant Colnett, on a fur-trading voyage of discovery to the northwest coast of America. He returned to England from China in 1789. The voyage of the *Prince of Wales* round Cape Horn to the North Pacific Ocean occupied nearly three years. Menzies had sent home a consignment of plants and he had brought back the ship's company in perfect health, only one man having died. He was then mustered in on board the *Discovery,* among the supernumeraries, as botanist. Of this fact Vancouver writes as follows in the introduction to his voyage:

"Botany, however, was an object of scientific inquiry with which no one of us was much acquainted; but as, in expeditions of a similar nature, the most valuable opportunities had been afforded for adding to the general stock of botanical information, Mr. Archibald Menzies, a surgeon in the royal navy, who had before visited the Pacific Ocean in one of the vessels employed in the fur-trade, was appointed for the specific purpose of making such researches; and had, doubtless, given sufficient proof of his abilities, to qualify him for the station it was intended he should fill. For the purpose of preserving such new or uncommon plants as he might deem worthy of a place amongst His Majesty's very valuable collection of exotics at Kew, a glazed frame was erected on the after part of the quarter-deck, for the reception of those he might have an opportunity of collecting."

Before setting out on the voyage, Sir Joseph Banks, at the request of Lord Grenville, furnished Menzies with formal instructions. He was to investigate the whole of the natural history of the countries visited, paying attention to the nature of the soil, and in view of the prospect of sending out settlers from England, whether grains, fruits, etc., cultivated in Europe were likely to thrive. All trees, shrubs, plants, grasses, ferns and mosses were to be enumerated by their scientific names as well as those known in the language of the natives. He was to dry specimens of all that were worthy of being brought home and all that could be procured, either living plants or seeds, so that their names and qualities could be ascertained at His Majesty's gardens at Kew. Any curious or valuable plants that could not be propagated from seeds were to be dug up and planted in the glass frame provided for the purpose. He was also to examine beds of brooks, sides of cliffs, and other places in a search for ores or metals and mineral substances. He was also to note the sort of beasts, birds, and fishes likely to prove useful either for food or in commerce. Particular attention was to be paid to the natural history of the sea-otter and wild sheep, and he was to note particularly all places where whales or seals were to be found in abundance. Inquiry was to be made into the manners, customs, language, and religion of the natives and information obtained concerning their manufactures, particularly the art of dyeing. He was to keep a regular journal of all occurrences, which journal, together with a complete collection of specimens of the animals, vegetables, and minerals obtained, as well as articles of the clothes, arms, implements, and manufactures of the Indians, was to be delivered to His Majesty's Secretary of State or to such person as he should appoint to receive them.

Lord Grenville, in transmitting a copy of these instructions to the Lords Commissioners of the Admiralty under date of February 23, 1791, emphasizes the necessity for impressing upon the commander of the ship that he was to afford every degree of assistance to Mr. Menzies, as the service he has been directed to perform "is materially connected with some of the most important objects of the expedition." Sir Joseph Banks was apparently apprehensive as to the treatment he might receive, as witness his last letter to Menzies (August 10, 1791), in which he says: "How Captain Vancouver will behave to you is more than I can guess, unless I was to judge by his conduct towards me—which was not such as I am used to receive from persons in his situation . . . . . As it would be highly imprudent in him to throw any obstacle in the way of your duty, I trust he will have too much good sense to obstruct it."

Although Captain Vancouver and Menzies were usually on good terms, the latter being permitted (according to Sir Joseph's wish) to build a glass frame for his plants upon the quarter-deck, yet the relationship became strained when the Captain demanded Menzies' journals and the latter refused to give them up until Sir Joseph Banks and the Admiralty had granted permission, which was in accordance with instructions issued to him before entering upon his voyage. Menzies' work was further retarded when Vancouver took the man who was tending the plants and placed him before the mast. When Menzies complained that he had lost many of his best plants through this action, Vancouver placed him under arrest for "insolence and contempt." Although the ability of Captain Vancouver and the fact that he accomplished fine work is readily admitted by every one, yet he appears to have been

indiscreet at times in exceeding his powers in the matter of discipline. Sir Charles H. Read, who had access to a copy of Vancouver's journal which had been annotated by the surgeon's mate of the *Discovery,* remarks that Vancouver "seems to have been a somewhat arbitrary commander," but this is probably explained by Vancouver's poor state of health at this time.

From Chili, Menzies brought home the monkey puzzle tree (Auraucaria imbricata), the first to be introduced into Great Britain. The story is told that he obtained seeds of this tree when dining with the Spanish Viceroy at a banquet at the Capital St. Jago. While dessert was being served Menzies noticed some nuts of a kind he had not seen before; he put some in his pocket, and on returning to the ship planted them in the glazed frame which had been erected on the quarter-deck for the purpose of preserving plants for the Royal collection at Kew. By the time the ship returned to Britain five of the seeds had taken root and grown into young trees. One of these lived at Kew until the autumn of 1892. There are many entries in the journal showing the activities of this naturalist. As mentioned before, Surgeon Cranstoun of the *Discovery* had been ill and was released on September 8, 1792, to go home from Nootka. Menzies had been doing the work while the surgeon was ill, and he was then appointed to the vacancy. Vancouver afterwards complimented him by showing that no one life had been lost by sickness during the entire voyage.

Menzies made great collections of plants and other objects of natural history. In the Sandwich Islands he ascended Wha-ra-raie and Mauna Loa, an active volcano over 13,000 feet high. He measured their heights with the barometer.

Menzies served on board the *Sanspareil* in the West Indies, under Lord Hugh Seymour, but on returning to London resigned and took up the practice of his profession. He died in Ladbroke Terrace, Notting Hill, on February 15, 1842, and was buried at Kensal Green Cemetery, London, N.S. Menzies left no family, and his wife died some five years before his decease. He had been elected a Fellow of the Linnean Society, in 1790, and on the death of A. B. Lambert on January 10, 1842, he became the president of the Society for the one month of life that remained for him. A fine painting of this distinguished naturalist hangs on the walls of the Linnean Society's Burlington House.

After Vancouver's departure from British Columbia in October 1792, three decades elapsed before the records indicate the arrival of any more medical men in this vast territory. During this period the Nor'Westers, ever in the vanguard of exploration and expansion had not been idle. Alexander MacKenzie, a Nor'Wester, discoverer of the MacKenzie River, which he had traced to its mouth in the Arctic Sea, had succeeded in crossing the continent. The Pacific was reached on July 22, 1793, in the vicinity of Bella Coola. MacKenzie was the first white man to reach the Pacific by the overland route. In 1808, Simon Fraser, another Nor'Wester, explored the river that now bears his name. It had been thought that this stream might be the Columbia and to decide this, Fraser was ordered to trace it to its mouth. Before he reached the present site of New Westminster, where he saw the tide ripples on the water, he knew he was not on the Columbia. Near the mouth and in sight of the sea, hostile Indians barred his further progress. However, he had fulfilled his order; he had followed the unknown river to tidewater. Another Nor'Wester, David Thompson, was also making history. From 1796 to 1807 he had explored and made himself familiar with the vast territory between Lake Superior and the Rocky Mountains. In the latter year he reached the Big Bend of the Columbia, following it up (south) to its source in the Kootenays. Trading forts were established in what is now Montana and Idaho, but it was not until 1811 that he reached the Columbia mouth at Astoria, to find that Astor's men had beaten him in the race by a short two months.

Eighteen hundred and twelve was a fateful year. War had broken out between Canada and the United States. True soldiers of fortune as the Nor'Westers ever were, they decided to take advantage of that war and capture Astoria. When the Nor'Westers swept down on the post, MacDougall, himself an old Nor'Wester, now in charge of Astor's interests, welcomed his rivals in trade—his friends of yore—with open arms. On October 14, 1813, Duncan MacDougall sold out the furs and provisions in Astoria, worth $100,000, for $40,000. In thirty years "The Pedlars", as the English called the Nor'Westers, had explored from Lake Superior to the Pacific, from the Missouri to the Arctic. The rivalries and enmities of the two great fur companies, Hudson's Bay and Northwest, now became so intense that it culminated in the Battle of Seven Oaks, a few miles north of Winnipeg, in 1816. Governor Semple of the Hudson's Bay Company and a number of his men were killed. A truce was called and the companies were amalgamated under the name of the older partner. A new colossus of empire appeared in the person of Dr. John McLoughlin who was to hold sway over this vast Domain for more than twenty years, 1824 to 1846.

(To be continued)

Hospital Service Department Notes

HOSPITAL TOPICS CONSIDERED AT THE ONTARIO MEDICAL ASSOCIATION

One of the outstanding features of the Ontario Medical Association Convention at the Niagara Falls meeting was the report of the Inter-Relations Committee, which formed the basis of discussion at the Round Table Dinner. The Committee had made an exhaustive study of the problems relating to our medical services and their relationship to the public and, while the meeting, after a lengthy discussion, did not feel that there had been sufficient opportunity for study to permit endorsement of the conclusions and recommendations submitted, it was generally agreed that the Inter-Relations Committee had made an unusually fine contribution to the study of these problems.

Among other details, our hospital services were studied and some of the observations made are of considerable interest. The Committee was of the opinion that our hospitals are now in a stage of transition, in which the hospitals are devoting less of their services to the acutely ill patient and more to the clinical study of all forms of illness, especially through the outpatient departments and the radiological and other diagnostic laboratories. It was recommended that:—

1. The outdoor department of the hospital be developed as an organized health centre, the cost of same to be available to the individual at the request of the family physician.

2. Hospital costs be reduced for the majority of the people, thus giving the thrifty citizen the same assistance as the indigent.

This first suggestion is in accord with the widely held opinion that some effort should be made to make proper and complete diagnosis cheaper and more readily available and thus earlier and more effective. The general establishment of diagnostic centres on a paying or subsidized basis would be a definite advance in health methods and the hospital would be the logical choice of location for such facilities, although one doubts the practicability of the suggestion in the report that "diagnostic clinics carried on at all hospitals should be compulsory." This would be unnecessary where two hospitals serve a small centre or in small rural hospitals.

The second recommendation is a most reasonable one. Of course hospital deficits would increase and these must be met. A proposal of the Committee is that the hospital maintenance of every person be provided for to the extent of the combined municipal and government grants, thus entitling him to public ward accommodation, extras or better accommodation being paid for privately. Undoubtedly this would put the major cost of hospital maintenance where it belongs,—upon the well majority rather than upon the sick few at a time when they can least afford to pay. However the statutory grants alone would not suffice, for in practically all hospitals they are far below the actual cost of maintenance. In Ontario the combined grants amount to $2.35, while the average cost per patient day is $3.74. The arrangement in Denmark is worthy of notice. The government insists upon low hospital charges and the tremendous deficit which results from the low private or sick-benefit club income is paid by the state.

Other suggestions relating to hospitals were that hospitals be thoroughly equipped, supervised and located at strategic points all over the country, that the province should be divided into well defined areas for hospital purposes, that hospitals be used to serve as educational centres in all matters pertaining to health, and that every doctor should be on the staff of some hospital and should report to that hospital all deaths occurring in his practice.

AN IMPORTANT HOSPITAL CONVENTION IN NOVA SCOTIA

The youngest of the hospital associations in Canada, that of Nova Scotia and Prince Edward Island, celebrated its third birthday by holding a most successful meeting in June in the apple-blossom town of Windsor. Appreciation of the value of this organization to the hospital and medical workers of the province has resulted in a wide-spread interest in and support of the work of this association. The keynote of the convention was "education"—education of the public and of the municipalities, education of the hospital workers themselves, and, that subject so much to the fore at present, the education of the student nurse.

Many problems of general and local interest were discussed. The Hon. Dr. G. H. Murphy, the Minister of Health, gave an able address in which he dwelt at some length with the tuberculosis problem in Nova Scotia and outlined the plans of the Ministry of Health for its amelioration. Realizing that segregation is one of the most important factors, the establishment of tuberculosis annexes in selected general hospitals to supplement sanatorium care was urged. It was pointed out that such an arrangement would be not only a measure of economy, but would foster and develop community education and sentiment. One annex is now being established at Inverness, C.B., and it is anticipated that arrangements will be completed for another at Sydney. Incidentally, the creation of this Department of Health

and the appointment of Dr. Murphy to the position of Minister have met with wide approval of health workers who feel that much greater progress may be anticipated now than hitherto. Strong endorsation of the movement to enforce higher standards of nursing education was expressed and the appointment of an inspector of training schools for the province was supported. While no immediate satisfactory solution of the problem of nurse unemployment could be offered, the employment of more graduates by the hospitals, the limitation of production by curtailment of training schools, and the preparation of nurses for special fields, such as public health nursing, social service, child-welfare work, etc., was urged.

The proposal to establish a national hospital organization, to be constituted as a Council of the various provincial or regional hospital organizations, was outlined by Dr. Harvey Agnew, of the Canadian Medical Association. There was general unanimity of opinion that a Canadian Hospital Council would be of considerable value in the solution of many general problems and arrangements were made to send two representatives to the organization meeting in September. The guest-speakers were Miss Mary Beard, R.N., the Assistant Director, the Medical Sciences, the Rockefeller Foundation, who spoke on maternal welfare and described the training and rôle of the qualified midwives in certain European countries, and Miss E. L. Smellie, Chief Superintendent of the Victorian Order of Nurses in Canada, who discussed certain relationships and responsibilities involved in working out an effective health program. The attendance of medical men was most gratifying and among those who read papers or took an active part in the discussions were Drs. O. B. Keddy, Mayor of Windsor; John G. MacDougall, Smith L. Walker, H. L. Scammell, and P. Campbell, of Halifax; D. S. Hartigan and F. T. MacLeod, of New Waterford, J. W. Reid and F. R. Shankel, of Windsor; Arthur S. Burns of Kentville; and M. R. Elliott and C. E. A. De Witt of Wolfville.

TRAINING SCHOOLS AFFILIATE WITH TRANQUILLE SANATORIUM

Nurses in training in a number of the general hospitals in British Columbia are now to be given special training in tuberculosis by virtue of affiliation between the hospitals participating and the Tranquille Sanatorium. This arrangement has been completed by the medical superintendent, Dr. A. D. Lapp, who first outlined his scheme of affiliation before the British Columbia Hospitals Association two years ago. The course consists of two months' training in practical nursing and in operating room and laboratory technique and an extensive series of lectures on the various aspects of tuberculosis delivered by members of the medical staff. Hospitals reported as participating in this scheme of affiliation are the Vancouver General Hospital, St. Paul's Hospital, Vancouver, St. Joseph's Hospital, Victoria, Kootenay Lake General Hospital, Queen Victoria Hospital, Revelstoke and Prince Rupert General Hospitals. It is hoped that this arrangement will be not only a valuable training to the nurses, but will be another means of disseminating knowledge concerning tuberculosis prevention among the general public with whom these nurses come in contact.

Provincial Association Notes

THE NEW BRUNSWICK MEDICAL SOCIETY

The annual meeting of the New Brunswick Medical Society was held at Campbellton on July 14th and 15th. The scientific program included the following papers: "Progress in the treatment of fractures" by Dr. W. R. MacAusland, Boston; "Diagnosis and treatment of carcinoma of the rectum," Dr. R. B. Cattell, Boston; "Cause and treatment of uterine bleeding", Dr. Phaneuf, Boston; "Physiotherapy", Dr. W. F. Roberts, Saint John; "Ante- and post-natal care in obstetrics", Dr. W. B. Hendry, Toronto; "Treatment of peptic ulcer", Dr. Prebble, Boston; "The mental aspect of disease", Dr. Geo. S. Young, Toronto; "What becomes of gall-stone patients?", Dr. C. P. Dagneau, Quebec.

Dr. Prebble's paper was read by Dr. Stanley Bridges, of Saint John, owing to an unfortunate accident to Dr. Prebble which occurred on his way to Saint John when the car in which he was riding was involved in a collision. Dr. Prebble's injuries were painful but not of a too serious nature. A resolution of sympathy was wired to him during the meeting.

The papers, as a whole, were of an extremely high order and were listened to with great interest. Special mention may possibly be made of the paper of Dr. George S. Young of Toronto which seemed to attract unusual attention from his listeners. Dr. Young's personal experiences in the use of suggestion as an aid to the cure of disease covered a long personal practice and were related in a fascinating manner.

The business sessions were largely attended

and several of the resolutions elicited very free and sometimes heated discussions.

The election of officers resulted in the following slate:— *President*, Dr. J. A. M. Bell, Newcastle; *First Vice-president*, Dr. V. D. Davidson, Saint John; *Second Vice-president*, Dr. P. Laporte, Edmundston; *Treasurer*, Dr. D. C. Malcolm, Saint John; *Secretary*, Dr. R. M. Pendrigh, Saint John; *Council:* Drs. C. J. Veniot, Bathurst; J. F. L. Brown, Woodstock; W. E. Gray, St. Stephen; H. E. Britton, Moncton; E. Sormany, Edmundston; E. Sterling, Fredericton; J. R. Nugent, Saint John.

Dr. A. S. Kirkland was again returned to the Editorial Board of the *Canadian Medical Association Journal*, and in conformity with the wish of the Canadian Medical Association, the New Brunswick members of the Canadian Medical Association Council were re-elected.

A resolution was forwarded to the New Brunswick College of Physicians and Surgeons that in the opinion of this Society, local examinations by the College should be abolished and that the only portal for entry for practice in New Brunswick should be by certificate from the Medical Council of Canada.

A discussion, instigated by Dr. J. M. Barry, of Saint John, culminated in the following resolution, unanimously adopted by the meeting, namely:

"That the New Brunswick Medical Society expresses itself most strongly that the present school curriculum entirely disregards the health of children and is to be strongly condemned. We feel that the school hours are entirely too long and are contrary to the spirit of the child-labour act and also that home work should be discouraged.

"We feel that the present age of six years is too young for admission to school and this should be raised to seven years. In the meantime the present law of six years, as the minimum age of admission to school, should be strictly enforced, as we believe that many children are going to school before attaining the age of six years.

"The Society has appointed a Committee to study this matter carefully and we sincerely urge the New Brunswick Commission of Education to avail itself of the advice of this Committee."

In the discussion that followed, Dr. T. C. Routley took part and expressed himself that this was one of the most interesting and useful cases of new work that he had been privileged to listen to for some time and hoped that the matter might be taken up in the major Society.

The annual dinner of the Society, held in the St. Louis Hotel, was the occasion for the presidential address, delivered by Dr. W. L. Earle. The chief subject of his address was "State medicine as it affects the physician." Dr. Earle's paper showed evidence of much reading and was followed by his audience with the very closest attention.

During the course of the dinner, the sentimental side of medicine was beautifully demonstrated by two addresses, one of felicitation by Dr. L. G. Pinault, and one of presentation by Dr. Daniel Murray, preliminary to the presentation to Dr. H. Lunam, of Campbellton, of a gift from his confrêres in Campbellton. The occasion of the presentation was the fiftieth anniversary of Dr. Lunam's local practice in Campbellton. The Gallic eloquence of Dr. Pinault was matched word for word by the sincere appreciation expressed by Dr. Murray, in outlining the respect and affection in which Dr. Lunam is held in the community in which he works. Dr. Lunam's response was short, witty and entertaining.

The annual golf tournament for the VanWart challenge trophy was won by Dr. W. W. Fleck of Dalhousie.

The success of the buffer committee dealing with compensation matters is now assured after several years experience. The affairs of the Compensation Board are handled in a practically frictionless manner by this committee. For the following year, the following members will act: Dr. E. A. Hughes, Chairman, Dr. Otty Evans, Dr. Jos. Tanzman.

Free tonsil clinics came in for a large amount of discussion and it was decided that in future all tonsil clinics, sponsored by whatever organization, would have a better degree of success assured if they be handled in collaboration with the local physicians and preferably through the Medical Society.

A recommendation is to be forwarded to the provincial government, requesting assistance in providing free radium for indigent cancer cases. In this connection, Dr. G. A. B. Addy announced that in the new hospital being built at Saint John, provision would be made for a diagnostic and therapeutic clinic for cancer cases.

The absence of Dr. G. Clowes VanWart was noted with regret. Dr. VanWart is a regular attendant at all medical meetings but is at present absent on a world tour.

The meeting of the Society in 1932 will be held in Moncton.

The Society went on record as seconding the invitation of Saint John to the Canadian Medical Society to hold their meeting in Saint John in 1933.

The New Brunswick Medical Society honoured itself in making Dr. T. C. Routley an honorary member, and it is hoped that he will be a regular attendant at all future meetings.

THE MEDICAL SOCIETY OF NOVA SCOTIA

The 78th annual meeting of the Medical Society of Nova Scotia was held at Truro on July 7th, 8th and 9th. The attendance was unusually large, and the meeting proved successful in every way. The Canadian Medical Association was represented by Drs. T. C. Routley, George S. Young and W. B. Hendry, of Toronto. Dr. Young gave the Address in Medicine, dealing with the mental aspects of disease; while the Address in Obstetrics fell to Dr. Hendry, who discussed ante-natal and post-natal care. Both addresses were keenly enjoyed. Dr. George D. Stewart, of New York, who was to have delivered the Address in Surgery, was unfortunately unable to be present, on account of illness. Papers were read by Dr. R. A. H. MacKeen, Halifax, on "The bacteriophage"; Dr. D. MacDonald, North Sydney, on "The menace of birth-control"; Dr. D. McNeil, Glace Bay, on "Cæsarean section"; Dr. Frank Mack, Halifax, on "Frequent urination"; and Dr. G. R. Burns, Halifax, on "Cardiac conditions simulating the acute abdomen." Dr. McNeil reported the case of a woman on whom he had performed Cæsarean section to terminate five successive pregnancies—always with excellent results.

One afternoon was left open for recreation for those not occupied at committee work. Several visited the Training School (for feeble minded children) and the Maritime Home for Girls, but the majority entered the golf tournament for which there was a large entry list. Tea was served at the club house of the golf club. On the evening of that day, the banquet was held, when the wives of many of the members joined in the festivities. On this occasion Dr. Dan Murray, of Tatamagouche delivered his presidential address, and, in response to the toast to "Our Visitors", Drs. Young, Hendry, and Routley spoke briefly. The addresses were followed by the presentation of trophies to the winners in the golf competition, the presentations being made by Judge S. D. McLellan, of Truro. The fortunate recipients included Drs. J. J. MacDonald, A. Fraser MacGregor, and W. H. Robbins, of New Glasgow, Dr. G. W. T. Farish, of Yarmouth, and Dr. W. L. Muir, of Halifax.

The afternoon of the final day was largely given over to a round table discussion of such topics as birth control, maternal mortality, tuberculosis and cancer.

It was decided that hereafter the annual meeting will be held on Tuesday and Wednesday early in July, in order that meetings of the New Brunswick and Prince Edward Island societies may follow in the same week and permit representatives of the Canadian Medical Association to visit each society without loss of time. Official delegates were appointed to represent the Nova Scotia society at next year's meetings of the other maritime provincial societies. In this way, it is hoped to both establish more intimacy between members of the profession in the Maritime Provinces and to further the interests of the national association in this part of Canada.

New officers were elected as follows: *President*, Dr. W. R. Dunbar, Truro; *First Vice-president*, Dr. D. McNeil, Glace Bay; *Second Vice-president*, Dr. W. N. Cochran, Mahone Bay; *Treasurer*, Dr. W. L. Muir, Halifax; *Secretary*, Dr. S. L. Walker, Halifax. Next year's meeting is to be held at Kentville, on July 5th and 6th.

ONTARIO MEDICAL ASSOCIATION DISTRICT NUMBER NINE,

The annual meeting of District Number Nine was held at the Muskoka Hospital for Consumptives and Calydor Sanatorium, Gravenhurst, on Wednesday, August 5th. Commencing at ten o'clock in the morning, Dr. Norman S. Shenstone, of Toronto, gave a paper on "Empyema" with lantern-slide illustrations. This was followed by a talk on "Recent progress in anæsthesia in its various uses" by Dr. Samuel Johnson, of the Toronto General Hospital, and an address by Dr. W. J. Bell, of the Department of Health of the Province of Ontario, on "Mutual interests".

At twelve o'clock noon, the whole party drove to Calydor, where they were the guests of Dr. C. D. Parfitt for luncheon. Immediately following the luncheon, Dr. T. C. Routley gave a short address on "Medical organization". This was followed by a Round Table discussion on the "Economic side of the practice of medicine". The discussion was opened by Dr. J. H. Holbrook of the Mountain Sanatorium, Hamilton. Dr. A. R. Riddell of the Department of Health for Ontario then gave a talk on "Silicosis".

At three o'clock, the party returned to the Muskoka Hospital where the remainder of the afternoon was spent in recreation,—bathing and surf-riding,—followed by a most delightful launch trip on the lake.

Following dinner at the Muskoka Hospital, Dr. L. J. Austin, Queen's University, Kingston, President of the Ontario Medical Association, gave a most interesting address entitled "Medicine in the eighteenth century".

Thirty-two members of the medical profession were present at this meeting, and all voted it one of the most enjoyable days they had ever spent. Many expressions of appreciation were heard with reference to the kindness of Dr. W. B. Kendall, of the Muskoka Hospital for Consumptives, and Dr. C. D. Parfitt, of Calydor Sanatorium, for the part they played in making the meeting such a pleasant one.

University Notes

University of Leeds

The centenary of the Leeds School of Medicine was impressively and pleasantly celebrated on July 1st. The growth of what is now the Medical Faculty of the University of Leeds from the Medical School founded in 1831 makes a stimulating story. The school was united with the Yorkshire College in 1884. By this act of union the Yorkshire College was enabled to apply for admission to the Federal Victoria University and became one of its constituent colleges in 1888. In 1904 the University of Leeds became an independent university on the disruption of the Victoria University. From its earliest beginnings, when it found accommodation in a few back rooms in North-street, the progress of the medical school has been steady and encouraging.

In 1894 a long cherished wish was realized, and the present building at Thoresby-place was opened by the King and Queen, at that time the Duke and Duchess of York. Excellent accommodation was secured for the anatomical department; what was deemed adequate for physiology and pathology was provided, and the facilities for the teaching of the other subjects were greatly increased. This building occupies three sides of a quadrangle, and though little has required to be altered in the structure, extensions to improve the accommodation for physiology and pathology have been found necessary. The first requirement has been met by the completion of the fourth side of the quadrangle. The large new block which is being put up in the immediate vicinity of the main building will give ample accommodation for an Institute of Pathology.

The main event in the celebrations was the congregation of the university over which the Chancellor, the Duke of Devonshire, presided. About fifty delegates from the other universities of the country and of other teaching bodies and institutions, were first received by the Chancellor, and addresses of welcome were then given by him and by the Vice-Chancellor, Sir James Baillie. Replies were made by Sir Humphry Rolleston and by Major-General Hime, R.A.M.C., a former pupil of the school. Honorary degrees were then conferred upon Dr. Hawkyard, who occupies the position of Lord Mayor, on Dr. Jane Walker, Dr. A. G. Barrs, Sir John Bland-Sutton, Lord Dawson of Penn, Sir Walter Morley Fletcher, Sir Gowland Hopkins, and Sir George Newman.

On the evening before the formal ceremony a dinner was given by the past students of the school, at which most of the delegates were present.

The celebrations have done much to emphasize the unity of the university, of which indeed the school is the oldest part. Its old names need not even now be laid aside, and as the Medical School of the University of Leeds its continued development and prosperity is assured.—Abridged from *The Lancet*.

The University of London

On the occasion of the centenary meeting of the British Association, to be held in London in September, the Senate has decided to confer the degree of Doctor of Science *honoris causa* on the President of the British Association, General the Right Hon. J. C. Smuts, C.H., F.R.S., on Sir Frederick Gowland Hopkins, D.Sc., M.B., President of the Royal Society, and on Lord Rutherford of Nelson, O.M., Sir Charles Scott Sherrington, O.M., G.B.E., M.D., and Sir Joseph J. Thomson, O.M., Master of Trinity College, Cambridge, Past Presidents of the Royal Society.

McGill University

In the very interesting report that Sir Arthur Currie presented at the annual meeting of the Council of McGill University a few weeks since, the Principal referred to the great progress made by the Medical Faculty during the past ten years. He stated that within that period that the standards of admission and achievement in every year had been raised; that the number of students had been limited by introducing a selective system; and a full time dean with suitable staff had been provided; and many material and physical additions had been made. The facilities for research had been increased in a superlative degree. There was now a great deal of research in progress. Sir Arthur stated that it was his aim to keep the school in a preëminent position as a teaching school, and, to do this, none but the most outstanding men and the most inspiring teachers must be selected to fill our professorial chairs. McGill must become a centre for medical research. The endeavour must be to develop a great post-graduate medical school.

Mrs. Blanche Hutchinson, of Baie d'Urfe, Que., has made two gifts to aid research work at McGill University. She has given $10,000 to the Department of Psychiatry, to be used in connection with the work being done by Dr. David Slight, who within recent years has made great advances in the teaching of this subject and has also been engaged in research work of very high order. Mrs. Hutchinson has also given the sum of $4,000 to Dr. Maurice Brodie, to be devoted to completing his experimental work on infantile paralysis.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

The King and Queen visited Edinburgh for ten days at the commencement of July, when they were in residence at Holyrood Palace. In addition to their Majesties attending a command performance of "Admirable Crichton" at the Lyceum Theatre, given in aid of the Royal Infirmary Extension Fund, the Queen called at several of the hospitals in the city. The Queen Mary Nursing Home, which was built by public subscription some eighteen years ago to meet the needs of middle-class patients, and the Elsie Inglis Memorial Hospital were among the institutions visited.

During the second week in July, the Congress of the Universities of the Empire, of which the Prince of Wales is President, met in Edinburgh. Seventy British universities were represented. Previous Congresses were held in London in 1912, Oxford in 1921, and Cambridge in 1926. The opening address was delivered by Sir Thomas Whitson, Lord Provost of the city of Edinburgh. Addresses were given on subsequent days by the Most Hon. the Marquess of Linlithgow, K.T., the Right Hon. Lord Meston of Agra and Dunnottar, Chancellor of the University of Aberdeen, and by Sir Donald MacAlister, Bart., Chancellor of the University of Glasgow. Daily discussions were held on subjects of academic and educational interest, such as Post-Graduate Study in Medicine and Surgery, Facilities for Overseas Students in British Universities, Conditions of Admission to Universities and their Effects, etc., etc. Visits were paid to the various university departments of chemistry, animal genetics and zoology, and to the Edinburgh Training College for Teachers, and several new educational establishments. The delegates were entertained to lunch by the Royal College of Physicians and the Royal College of Surgeons. In addition a visit was paid to the University of Glasgow.

The Report of the University Grants Committee contains some interesting information. This is an authoritative publication, as it is on the advice of this committee that the Treasury now disburses the sum of a million and a half pounds annually among the universities and university colleges of Great Britain. The total enrolment of whole-time students in 1928-29 was 44,309. The enrolment for the four Scottish universities was 10,567, of whom 6,981 were men and 3,586 were women. Considering that the population of England is somewhere about nine times that of Scotland it will be realized how much more important a university education is considered in Scotland than south of the border. Glasgow was the largest Scottish university with 4,949 students; Edinburgh came next with 3,616; Aberdeen was third with 1,325 and St. Andrew's, including Dundee University College, had 677. Edinburgh University still had the largest numbers of overseas students from the Empire and from foreign countries. Of these there were 4,390, and 636 were at Edinburgh, 564 at Cambridge, and 558 at Oxford. Comparative figures are given of the students living in university halls or colleges or in private lodgings or at home. In Scotland, 672 reside in hostels, 3,451 in lodgings and 6,824 at home. It will be seen that only 6.1 per cent of students live in university halls of residence.

A preliminary inspection of the census, which was compiled this spring, brings forth some interesting facts. Edinburgh has the distinction of having more surplus women than any other place in Scotland. There are 40,245 more women than men in the capital city. Over the whole of Scotland women are in the majority by 190,820. This excess of women over men is more marked in the larger cities than in the smaller towns and country districts. The population of Scotland is lower than it was ten years ago—4,842,554 against 4,882,497, a decrease of nearly forty thousand or 0.8 per cent. Of the larger burghs, the majority show an increase of population in the ten years. This is particularly so in Edinburgh and Glasgow, while nearly all the counties have suffered a decline. The rural districts, and more especially the Highlands and Islands, show a diminution. This decrease reaches its maximum in the case of Buteshire, where there has been a fall of 44 per cent. Since the last census the island of St. Kilda has been entirely depopulated by order of the Secretary of State for Scotland, and the inhabitants placed in suitable homes on the mainland.

The University of Edinburgh Alumnus Association is to change its name to the University of Edinburgh Graduates' Association. The membership of this association is 2,033. It produces twice every year the *University of Edinburgh Journal*. This magazine, which is a gold mine of information, is edited by A. Logan Turner, LL.D. As might be expected, it maintains a high standard, and in it are published articles of historic and academic interest. It is also well stocked with current university and general news. Last January it was suggested that the 350th anniversary of the foundation of the university might be fittingly commemorated by issuing a volume of her history during the past fifty years. This would carry forward the story so well told by Principal Sir Alexander Grant in "The Story of the University of Edinburgh during its first Three Hundred Years". A sub-committee was appointed to consider the proposal, with Sir

Thomas Holland, the Principal, as chairman. The University Court gave its approval to the project. The volume is now in course of preparation and will be published in the summer of 1933.

Important additions and improvements are to be made to Chalmers Hospital, Edinburgh. This hospital, of which the Dean and Faculty of Advocates are trustees, occupies an important place among the charitable institutions of the city. Nearly a hundred years ago George Chalmers, a plumber in the city, died and left some £30,000. The residue of this estate was to be used for founding the "New Infirmary or Sick and Hurt Hospital". It was not until some thirty years after that the hospital was opened. As it was erected, so it stands to-day, with four wards, two of which are open for paying patients at the modest charge of ten shillings a day. The cost of the improvement scheme is about £10,000. A generous donation of that sum has been intimated. The scheme, which is designed primarily to provide improved facilities for radiographic work at the hospital, involves the erection of a new wing in which the x-ray department and a new operating theatre will be situated. The work is expected to take about nine months to complete, and it is hoped that the necessary preliminaries will be carried through in time to permit of its being begun early next year.

Dr. A. Murray Drennan, F.R.C.P. Edin., of Queen's University, Belfast, has been appointed to the Chair of Pathology in Edinburgh University in succession to the late Prof. Lorrain Smith. Dr. Drennan is a graduate of Edinburgh University of 1906, when he won the Ettles Scholarship as the best student of the year. In 1916, Dr. Drennan was appointed Professor of Pathology in Otago University, New Zealand. During the war he served with the 22nd and 27th General Hospitals in the Mediterranean Expeditionary Force.

At a meeting of the University Court of Edinburgh University, Dr. Sydney Smith, Professor of Forensic Medicine, was appointed dean of the Faculty of Medicine in succession to the late Prof. Lorrain Smith. Professor Smith was also appointed the University representative on the General Medical Council.

GEORGE GIBSON.

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

The events of the annual gathering of the British Medical Association can generally be divided into those that interest the public, those that affect the well-being of the profession, and those that advance medical knowledge, the three rarely being coincident. At Eastbourne, at the ninety-ninth meeting, these three categories were to be observed. In the public eye was a discussion on suicide and another on sex-education, this latter being attended by a Bishop and other church representatives, as well as by school-masters and other social workers. Affecting the interests of the profession were several debates, resolutions and "referring back" motions in the course of the annual representative meeting. Among these was a strong protest against any limitation in the free choice of doctor by insurance patients and a very useful debate on the problem of the out-patient on the lines already mentioned in these notes. Of the scientific advance of knowledge it is very difficult to speak until the full number of papers presented has been published; general opinion seemed to be that the meetings reached the usual standard of attendance and usefulness. The outstanding feature of the Eastbourne meeting, however, lay in the choice of the president and for the first time a full-time medical officer of health held this position. Dr. W. G. Willoughby visited Winnipeg last year, so that he needs no introduction to Canadian friends. His presidential address was a valuable summary of the relation between the medical profession as a whole and the care of the public health. One particular point of his remarks requires as much publicity as possible and this was his plea for a dissemination of the facts of how to keep well, to supplement the general education of the child and to counteract the subtle propaganda of the quacks and patent medicine vendors with their ever more wonderful advertisements.

Among recent anniversary celebrations has been the centenary of the Leeds School of Medicine, and at the beginning of last month a large gathering of famous members of the profession assembled under the presidency of the Duke of Devonshire to do honour to the work of this centre. Comparatively small in its earliest days the Leeds school received a stimulus under the guidance of Sir James Paget in the 'sixties and then blossomed out at the end of last century with a new building under the general urge of Thomas Scattergood who seems to have lived up to his name. Leeds has now the distinction of a medical Lord Mayor and the President of the College of Surgeons is one of its distinguished sons—Lord Moynihan—and Leeds also boasts other leaders in different branches of the profession.

Another recent celebration was the jubilee of the Midwives' Institute. It is perhaps not altogether realized how much of the fight for the proper training and raising of the status of the midwife has been carried on against officialdom and the Institute's fifty years of service is a splendid record. The treasurer and one of the founders of the Institute, Miss Rosalind Paget,

has been called "the Florence Nightingale of Midwifery" and those who know something of the work she has done do not grudge her this honoured title.

Two important institutions have been founded since the last letter. The foundation stones of the new medical school and pathological institute buildings attached to St. Mary's Hospital were laid by the Duchess of York at the beginning of last month and the development of this important institution where Sir Almroth Wright carries on his well-known work will be watched with great interest. The other ceremony took place in the heart of the country where Lord Moynihan laid the foundation stone of the Buckstone Browne Surgical Research Farm. This farm, one of the many magnificent gifts of Mr. Buckstone Browne to the cause of surgical science, will help the Royal College of Surgeons to develop its research side, by providing the very necessary centre for experimental biology.

A very typical example of English methods is seen in the present-day situation of the movement for birth-control. Beginning entirely in unofficial hands, headed by a small band of fanatical pioneers, the movement has just reached the stage of early official recognition, not by any Act of Parliament, but by a memorandum issued by the Ministry of Health to Local Authorities. This is really a great step forward, for advice on birth-control can now be given at welfare and maternity clinics without the risk of the financial support of the clinic being cut off at source. The memorandum was a very modest affair, so modest that its appearance was scarcely noticed, but it probably represents a definite milestone in the history of our race. Whether the road is uphill to prosperity or down to destruction must be left for history to decide; opinion here seems to be "fifty-fifty".

ALAN MONCRIEFF

London, August, 1931.

The Australian Letter

(From our own correspondent)

Post-graduate medical education in Australia is undergoing very considerable developments at the present time. As well as licensing medical qualifications, the medical faculties of the universities give the higher degrees of Master of Surgery and Doctor of Medicine. The conditions necessary to be fulfilled for these higher qualifications vary somewhat in the different universities. Under certain circumstances the degrees can be obtained by the submission of a record of original researches, coupled with clinical examinations, and, under other conditions, degrees are granted solely according to the result of examinations, theoretical and clinical, original research not being necessary. In addition to these higher degrees the Diploma of Public Health is granted by the Sydney and Melbourne Universities. In order to prepare for this diploma certain definite courses of training extending over two years have been instituted. The Diploma of Public Health is a requisite for most of the Government public health appointments.

As 40 per cent of the area of Australia lies within the tropics it is natural that interest should develop in tropical medicine. In 1909 the Institute of Tropical Medicine was established at Townsville, Queensland, in latitude 19° S., under the directorship of Dr. Anton Breinl. The Board of Management of this institute was constituted from representatives of the Commonwealth Government, Queensland Government, and the Universities of Sydney, Melbourne, and Adelaide, the cost of maintenance being supplied from these different sources. Its function was purely one of research into different branches of tropical medicine, varying from helminthology to climatology. A Royal Commission on Health was appointed by the Commonwealth in 1925 and one of its recommendations was the foundation of a School of Preventive Medicine and Tropical Hygiene in connection with Sydney University. As a result of this recommendation such a school was established and was opened in Sydney University in March, 1930. With the inauguration of this school the headquarters of tropical medicine has been pushed south to Sydney, out of the tropics, and the Institute of Tropical Medicine of Townsville remains as one of the stations of the Commonwealth Health Services. Arrangements between the Commonwealth Government and the Senate of the University of Sydney, which is, of course, a state institution, rendered possible the erection and development of this School of Public Health. The actual cost of upkeep is borne by the Commonwealth Government. Prof. Harvey Sutton, one of the earliest Rhodes Scholars of Victoria, is the Director of the School of Preventive Medicine and Tropical Hygiene in Sydney. Before taking up his duties there he visited America and Great Britain, and in developing this school the observations made overseas will be of importance. The general conditions in regard to the qualifications for the diploma of Public Health and Tropical Medicine have been based largely on those governing the granting of similar diplomas in the British Isles.

In 1922 the University of Sydney established a Diploma of Psychiatry, having the special opportunity of appointing to the Chair of Psychiatry, for a period of a few years, Sir John McPherson, who had just retired from the Directorship of Mental Hygiene in Scotland.

In Melbourne Diplomas in Ophthalmic Surgery, Oto-Rhino-Laryngology, and in Obstetrics and Gynæcology have just been instituted. In the main, the conditions required for these are eighteen months' special work, with two examinations. The first part covers the special anatomy and physiology, and part two actual practical work and attendance in special hospitals.

A very considerable movement in regard to post-graduate work has taken place through the foundation of the Australasian College of Surgeons. This Australasian College of Surgeons was established largely as a result of the visit to Australia of an American Mission, including Dr. Mayo, and Dr. Franklin Martin and Dr. Malcolm MacEachern of the American College of Surgeons. Up to that time the Mecca of all Australian surgeons had been the Fellowship of the Royal College of Surgeons, London. This entailed a long and expensive period of absence in England. The Australasian College has based its membership partly on the model of the Royal College of Surgeons of England. At this time it is not a definite examining body, but it aims at raising the standard of surgical practice. It has now become possible to prepare and study in Australia for the primary Fellowship of the Royal College of Surgeons in England. The first examination was held in August-September, 1931, external examiners being sent from England for this purpose. The membership of the College of Surgeons demands a high standard of surgical practice and also puts down as a qualification for membership very considerable surgical experience. After February, 1932, it will also be necessary to hold a higher degree in surgery. The Australasian College of Surgeons has as one of its main aims the promotion of research in surgery, and makes grants for this purpose. It publishes a quarterly journal of original work in surgery. Next year Lord Moynihan, as President of the Royal College of Surgeons of England, will visit Australia and present to the Australasian College of Surgeons a mace which is, at present, being wrought in England. The visit of Lord Moynihan next year should be a definite stimulus to surgical work in Australia. The Commonwealth of Australia donated a site at the Federal Capital at Canberra for the erection of the headquarters for the Australasian College of Surgeons. This is now the official headquarters of the College of Surgeons of Australia and New Zealand. Recently a College of Physicians of Australia has been established, patterned on its surgical sister.

Of recent years a very happy development has taken place in post-graduate education by the establishment of the Melbourne Permanent Committee for post-graduate work. This Committee arranges annual refresher courses for medical men and it is especially welcome and patronized by those who have had to go into the remote country districts for general practice, and who are, therefore, out of touch with the latest developments and latest phases of hospital work and have not the advantage and stimulus of constant association with their fellow workers. This Post-graduate Committee has also been instrumental in arranging for outstanding physicians and surgeons, both from the British Isles and America, to visit Australia to deliver special courses of lectures. Such visits owing to the very considerable expense in travelling and to the long time taken in transit make a very heavy demand on the resources of the Post-graduate Committee, as well as considerable sacrifice on the part of the visitor. It has been successful in bringing to Australia some leading men who have stimulated to a high degree the keen members of the medical profession here and whose visits will long be remembered. The Melbourne Committee also makes arrangements for special courses by Australian members of the profession.

In New South Wales such study is organized by the Post-graduate Work Committee of the British Medical Association. Co-operation between these two State bodies makes it possible for both States to benefit by the visits of the leaders who are brought out. South Australia and Queensland have recently established a committee for post-graduate study, and it is likely in the near future that these States will also be participants in such visits.

It is always the desire of Australian medical students on completion of their medical course to obtain a residentship at one of the leading public hospitals. Having completed this, the object of all such graduates is to travel to Europe and America for experience overseas. Shipping companies in the past have made this possible by appointing surgeons for the single trip and on the larger liners the practice has recently been established of carrying Assistant Surgeons, in return for passage, on recommendations by the Dean of the Medical Faculty. These positions are particularly held for the young experienced graduates who desire to benefit by overseas study. It may be that in the future shipping companies of the Pacific will, by a similar arrangement, render possible exchanges of positions between Canadian and Australian post-graduates.

ETHEL E. OSBORNE
University of Melbourne, Australia.

Topics of Current Interest

The Dosage of Digitalis

"Let the medicine be given until it either acts upon the kidneys, the stomach, the pulse, or the bowels; let it be stopped on the first appearance of any of these effects." This advice, given by William Withering, who wrote the first detailed study of digitalis 150 years ago, is quoted by H. Gold and A. C. DeGraff (*J. Am. M. Ass.*, 1930, **95**: 1237) in a recent paper on digitalis. They lay stress on its importance and point out that obedience to this ancient precept ensures that the patient is fully digitalized, whereas some methods used by modern physicians result in insufficient or excessive digitalization. They then discuss the vexed question of the dosage necessary to produce the optimum therapeutic effects in patients with auricular fibrillation and cardiac failure. The degree of cardiac failure is the factor of greatest importance in estimating the dose required, and for practical purposes they arbitrarily divide their patients into two groups; those showing signs of failure when at rest, and those who only develop signs of failure after a certain amount of exertion. In the first group, rapid digitalization with the largest doses that can be tolerated without toxic symptoms gives the best results; but in the second group such high dosage is usually unnecessary because there is a wide margin between the amount of drug required to produce full therapeutic effects and the amount that can be tolerated without toxic symptoms. In this second group, once the initial effect has been obtained, a relatively small dose can be continued for daily maintenance with the maximum therapeutic effect. The usual explanation of this is that the smaller doses are necessary in order to maintain the high "effective concentration" of the drug in the body produced by the larger. Gold and DeGraff, however, set forth evidence to show that the "effective concentration" necessary to maintain full therapeutic action is usually much lower than that required at the beginning of treatment. They also point out that there is another effect to be considered after the circulation has been restored—namely, the tendency for improvement to be maintained, irrespective of digitalis treatment. This varies with the different kinds and degrees of cardiac damage, and in their opinion plays a significant part in determining the dosage required in the later stage of treatment. The wide variation in dosage recommended by different authors is probably due to the fact that the same preparation may vary much in potency. Such variation may sometimes escape detection in the wide margin between the minimum dosage which produces the full effect, and the maximum tolerated without toxic symptoms.

Aspirin and Thyroid

Dr. Gerald Slot remarked* that practising physicians encountered the problem of addiction to hypnotics of the barbituric acid series, to thyroid preparations, and to the aspirin group. Drugs of the barbituric acid series did not bring about the same moral and physical degradation as opium and cocaine, but they were none the less very harmful. Thyroid was often taken by women who wished to get thin, and its addicts took it in enormous doses. One girl he had attended had developed argyria from the silver coating of the pills, besides the symptoms of tachycardia and swollen feet; she had been taking grs. 70 of thyroid a day. It was not uncommon to see women eat aspirin out of their handbags as though it was so much sugar. Again, although ergot-like preparations had been put on the Dangerous Drugs list, many ecbolics equally powerful or more so could be bought without restriction, such as pituitary extract and pennyroyal. The sale of drugs such as lysol and arsenic from automatic machines also constituted a great danger.—*The Lancet*, 1931, **1**: 1242.

Changes in Diet

The report on the preservation of food, issued by the Food Investigation Board and published by the Department of Scientific and Industrial Research marks a further stage in the progress from waste to economy, using these words in their widest sense, that has been so conspicuous a feature of modern life. The transport of food from its place of origin to its place of consumption has in the past been attended by heavy loss, due for the most part to deterioration. And deterioration, it may be feared, has often exerted harmful effects of a more serious kind than depreciation in value. Food in a state of decomposition, however slight, is certainly prejudicial to health. Today, happily, as the report points out, the methods of preservation by cold and other means have reached such a state of perfection that the distance of the field or orchard from the market is no longer a matter of great importance. Meat is carried in immense quantities now from one side of the world to the other with little or no loss of food value. The same is true of such fruits as apples and oranges. In short, the most perishable kinds

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* At a meeting of the Medico-Legal Society held on May 28, 1931.

of food can be preserved with as great ease and certainty as the least perishable. The resulting fall in prices has opened to the general consumer such a range of diet as was enjoyed formerly only by a few favoured individuals.

In consequence the nature of diet is changing in every European country, but most of all, perhaps, in this country. There is, for example, increased consumption of fresh meat, fruit, and vegetables. Recent study has made it clear that the new composition of diet is much to be preferred to the old on grounds of health, and the vital statistics of the country suggest that already the general standard of fitness is increasing. It may confidently be expected that further improvement will take place and that, in consequence, the toll of disease will be reduced and the capacity for work increased. These are important benefits. The available evidence supports the view that increased consumption is conferring benefit on home producers as well as on producers in the Empire, for new habits are being formed and new demands created.—*The Weekly Times*, June 25, 1931.

The Diet of Ancient Americans

An editorial in the New York *Herald Tribune* of October 7 calls attention to the fundamental differences in the native animals and plants of the New World as compared with those of the Old. It says:

"It is a curious fact that until Columbus' successor began carting back Indian foods to Europe, the two hemispheres lived on totally different diets. Tomato, potato, sweet potato, Indian corn, beans, pepper, Jerusalem artichoke, squash, pumpkin, peanut, even the tropical cassava, tapioca, avocado, pineapple, and cacao, were unknown in the Old World; and the men of the New World had no knowledge of the rice, wheat, rye, cabbage, parsnips, carrots, peas, pears, plums, cherries, apples, and other fruits which had for centuries made the Europeans fat. They did not even have the same domesticated animals, except for the Arctic dog. The turkey, the llama and the alpaca were unknown in Europe; the cow, horse, sheep, and pig were strangers in America.

"As E. D. Merrill, the director of the New York Botanical Garden, remarks in pointing out the facts in the current issue of the Garden's *Journal*, these are facts ruinous to the theory that the ancient civilizations of Peru, Central America, and Mexico came, half mature, by ship from Europe, Egypt, or from a sunken continent of Atlantis. 'What could have been the agriculture of the hypothetical Atlantis,' he asks, 'that transmitted to its supposed descendants in the two hemispheres not a single food plant and not a single domesticated food-producing animal in common.' A question which is a staggerer, indeed."—From *The Diplomate*.

Spoiling of Fat by Light

A careful study of the chemistry of the spoilage of fats by C. H. Lea, of the Low Temperature Station, Cambridge, England, has revealed the fact that light plays an important part in its development.

Mr. Lea found that under ordinary conditions fresh beef kidney fat keeps well for a certain initial period, and then quickly becomes rancid. When the fat is kept in darkness, there is a longer initial safe period before it begins to spoil.

Bright light has the opposite effect. If the fat is exposed to direct sunlight on a hot day, rancidity sets in very rapidly, and the initial safe period may be almost completely eliminated. If the fat is placed in sunlight long enough for spoilage to start, even subsequent removal to a dark place will not improve matters very much.—*Science News Letter*, Dec. 20, 1930.

Medical Patents

The problems involved in patents of therapeutic substances are of relatively recent origin. It was not until the late war caused a lack of certain drugs, many of which were subject to patent rights in this country, that the question came before the attention of those concerned with patent rights. The result was Section 38A of the Patents and Designs Act, 1919, which enacted that the comptroller might grant a licence for the preparation of a food or medicine, and should settle the terms of the licence and the amount of the royalty, with due consideration for making the food or medicine available to the public at the lowest possible cost, while allowing the inventor a proper reward for his research. This measure aroused considerable controversy in certain quarters, and still further publicity was given to the matter by the alleged commercial abuse of certain medical discoveries and the safeguarding by patent rights of insulin and other new preparations. A large section of the medical profession refused to sanction medical patents in any form, and the British chemical manufacturers declared that their work was being handicapped by this attitude, since it was not shared by many foreign workers. The question came before the representative body of the British Medical Association last year. The attitude of the Association's ethical committee was that a registered medical practitioner ought not to derive any financial benefit from any medical invention or discovery, but that, on the

other hand, medical practitioners could not desire to hinder industry or commercial research. A motion to affirm the old ethical position was referred back to the council on the ground that under modern conditions patents must be taken out, for the sake of the public as well as of the manufacturers. The council has once more considered the matter and recommends that the representative body shall this year express the opinion that medical men inventing or discovering substances or processes likely to be of therapeutic value may with propriety use the arrangements allowed by the law for protecting them. They may also accept a just reward, subject to the traditional ethical principle that they must not act against the public interests by unduly restricting the use or knowledge of inventions for their own gain. How this suggestion will appeal to the representative body remains to be seen.

Meanwhile the Board of Trade has published a report on the subject. The departmental committee heard evidence from — among many others—a joint chemical committee representing several institutions and from the British Medical Association and the Medical Research Council. The joint chemical committee suggested a scheme by means of which dedication would be compulsory for all patents taken out for inventions subserving medical purposes. It was argued that this would assist publication, preserve the British worker from exploitation and prevent any uncontrolled monopoly. The proposal was supported by the representatives of the British Medical Association and the Medical Research Council, but was opposed by a number of other witnesses, chiefly on the ground that any further restrictions on medical patents would discourage research or encourage secrecy. The committee, after very careful consideration, came to the conclusion that dedicated patents would discriminate unfairly against research workers and the fine-chemicals industry in this country and that a sufficient case had not been made out for their adoption. The committee do, however, recommend an alteration in the section where it says: "In the case of inventions relating to substances prepared or produced by chemical processes or intended for food or medicine, the specification shall not include claims for the substance itself, except when prepared or produced by the special methods or processes of manufacture described and claimed or by their obvious chemical equivalents." A decision of the law officer on the word "special" in this section had led in some cases to the refusal of patents for inventions produced by processes which could not be said to contain features of substantial novelty. The word "special" has enabled the Patent Office to refuse applications for mere prescriptions but, as a result of their attempt to hold the balance between avoiding the encouragement of futile claims and not unduly hampering invention, the committee have decided to recommend the substitution of the word "particular" for the word "special," together with the addition of a proviso stating that a mere admixture resulting in an aggregation of the known properties of the respective ingredients shall not be deemed to be a particular process of manufacture.—*Brit. M. J.*, 1931, **1**: 981.

Abstracts from Current Literature

MEDICINE

The Heart in Old Age. Willius, F. A., *Am. J. M. Sci.*, 1931, **182**: 1.

Willius has made a study of the hearts of 700 patients seventy-five years of age and older, from which he draws the conclusion that the heart which permits continuation of life to and beyond the seventy-fifth year is an organ of unusual quality. Almost half of the cases (45 per cent) presented no clinical evidence of heart disease, and almost half of the remainder (22 per cent) had never had any signs or symptoms of congestive failure, though they were found to have some form of heart disease. The most common abnormality encountered was hypertension which occurred in 54.2 per cent. Coronary sclerosis was present in 44.4 per cent, though only 12.2 per cent of these had symptoms of angina pectoris. Only one case of coronary thrombosis was found in the series, and aortic insufficiency, whether of luetic or arteriosclerotic etiology, was exceedingly rare.

E. S. MILLS

Anæmia of Dogs Produced by Feeding of the Whole Onions and of Onion Fractions. Gruhzit, O. M., *Am. J. M. Sci.*, 1931, **181**: 812.

Gruhzit has verified the finding of Sebrell that dogs may be rendered anæmic by feeding them on a complete nutrient diet plus Spanish onions. The author has further discovered that the anæmia may be produced by the onions or their juice even after they have been autoclaved. However, when the juice was dried the potency of the residue was considerably reduced. The mode of action of the onions or their juice is not established. Hæmolysis appears to play an important part, as the blood serum becomes tinged red shortly after therapy is begun. Blood smears show considerable fragmentation of the erythrocytes.

E. S. MILLS

Obesity, Constitutional or Endocrine? Silver, S. and Bauer, J., *Am. J. M. Sci.*, 1931, **181**: 769.

The authors discuss the question of the eti-

ology of obesity, emphasizing the constitutional background. Bauer found that only 2.6 per cent of 275 cases of obesity had their origin in clinically detectable disturbances of the glands of internal secretion. On the other hand, the family history in most instances will reveal obesity in other members of the family. The authors have found that the patients do not inherit an excessive appetite but a constitutional tendency to store fat from whatever food they eat. The existence of endocrine obesity, as after castration in Froelich's syndrome, is admitted, but they feel that the vast majority of cases do not fit into the clinical group dependent on endocrine dysfunction, but are the result of an inherent hereditary tendency to become obese.

E. S. MILLS

Gastro-Photography. Pannett, C. A., and Levi, D. and

Some Results with the Gastro-Photor. Wyard, S., *The Lancet*, 1931, 221: 174 and 177.

Paper number one describes details of construction and operation of the "Gastro-photor", an instrument designed by F. G. Back in Vienna. It consists essentially of two sets of stereoscopic cameras which can be introduced at the end of a tube into the stomach for the purpose of photographing the gastric mucosa. The principles and limitations are set forth and reproductions of photographs are shown. The principles are sound, but the technical difficulties many, although so many of these have been surmounted by their increasing experience that the authors have reason to hope that this method will become more and more applicable to clinical problems. The early recognition of gastric carcinoma seems to them a very feasible ambition and one justifying further study of this method.

Paper number two also describes the instrument and technique used and reproduces a series of photographs of various lesions of the gastric mucosa. Ulcers, polypi, and carcinoma are depicted and the photographic, radiological and operative findings are compared. The writer feels that this apparatus warrants further application to the study of gastric disorders.

J. B. ROSS

Studies on the "Acid Deficit" in Pernicious Anæmia. Connery, J. E., and Jolliffe, N., *Am. J. M. Sci.*, 1931, **181**: 830.

The authors report a case of pernicious anæmia in which free hydrochloric acid was found in the gastric contents at the beginning of a remission and was still present a year later. The patient, a man of 69 years, had all the signs and symptoms of the disease, including a moderately severe subacute combined degeneration of the cord. The blood picture was characteristic of the disease during an exacerbation. At this time there was complete achlorhydria even after histamine. After two months' treatment by liver extract, during which time the remission was established, the test meal was again done. Ninety minutes after, 0.5 mg. of histamine-free hydrochloric acid was present in the gastric contents, in amounts equivalent to 10 c.c. of tenth-normal sodium hydroxide per 100 c.c. of gastric contents. A year later the free acid was equivalent to 36 c.c. of tenth-normal alkali. The authors have tested eleven other cases of pernicious anæmia after a remission had been produced, but in no instance was a return of free hydrochloric acid found.

E. S. MILLS

Further Observations on a Family showing many Cases of Pernicious Anæmia. Gram, H. C., *Acta Med. Scand.*, 1930, Supp. to **34**: 107.

A most interesting family group is reported by Gram in which pernicious anæmia existed through two generations, and in which some of the members who were not frank cases of pernicious anæmia showed signs of some of the earlier stages. The first patient was a man who died at the age of 67 from pernicious anæmia. He likewise had the achylia gastrica which accompanies this disease. He had six children. The eldest was a son who died at 45 of pernicious anæmia and with achylia. The second was a son dying at 49 with the same condition. The third was a son who died at 43 of some heart disease. He had never been examined for anæmia. The fourth child was a daughter who was a severe case of pernicious anæmia, with complete achylia. She had been put upon a liver diet and was much improved. The fifth child was a daughter who had achylia, but whose anæmia was still of the simple type. The last child was a daughter who had simple anæmia and hypersecretion of gastric juice. In the third generation, there were ten grandchildren, ranging in age from 9 to 22. Although the blood changes in them were insignificant, only two of them had normal gastric secretion. Most of them were showing hypersecretion of gastric juice or hyperacidity or both. One of them also had a simple anæmia.

These findings are in agreement with the sequence of events described by Strandell which leads up to pernicious anæmia; acid gastritis, slight simple anæmia, irregular stools, glossitis, achylia, (between this time and the first period of hypersecretion and hyperacidity, there must be a time when the quantity and acidity of the gastric juice comes back to normal), severe simple anæmia, pernicious blood picture, and finally frank pernicious anæmia.

Routine examination of the gastric secretions

and of the blood in all the members of a family in which there is a case of pernicious anæmia might lead to a clearer conception of the etiology of the disease, as well as lead to much preventive therapy that would keep the terminal stages of the picture from appearing.

MADGE THURLOW MACKLIN

The Circulation in the Bone-Marrow in Relation to Certain Histo-Physiological Problems. Varela, M. E., *Rev. Méd. Latino-amer.*, 1930, **15**: 1538.

A coloured plate is given representing the network of sinusoids in the bone-marrow in the diaphysis, close to the epiphysis. The details are filled in by microphotographs which show the cellular components of the bone-marrow in their relation to the vascular lumen. The method of study was by saturation of the vascular endothelium *in vivo* with Indian ink, while at the same time passive congestion was produced by ligature of the venous outflow. The rabbit was used and Mallory's stain. The photographs show the sinusoid with its endothelial lining, the layer of erythroblasts external to that, foci of erythroblasts and leucoblasts external to this layer, and histiocytic macrophages beyond these. Megacaryocytes are shown projecting into the lumen of the sinusoids, with erythrocytes adherent (phagocytosis). In regard to the question of whether these sinusoids are open or closed, Varela decides they are closed, though it is possible they may open here and there to allow blood-cells and platelets to enter the circulation from time to time, considering that these cells have not the power of diapedesis.

O. C. GRUNER

The Specificity and Reversible Character of the Megaloblastic Reaction in the Bone-Marrow in Pernicious Anæmia; the Morphological Character of the Megaloblasts. Varela, M. E., *Rev. Méd. Latino-amer.*, 1930, **16**: 175.

The conclusions are based on a study of the material obtained by biopsy of the bone-marrow, instead of the circulating blood or post-mortem material. The author finds that when cases of pernicious anæmia are treated by Minot's and Murphy's diet, or by liver extract, the clinical improvement goes with a reversion of the bone-marrow to normality, until it becomes entirely orthoplastic, when the remission is complete. The histological picture in the bone-marrow is dominantly one of leptochromatism in the Biermer anæmia. In hæmolytic icterus the picture is pachychromatic and basophile. In infantile splenic anæmia, the reaction is macronormoblastic. The reversibility of the reaction shown by these studies is therefore of clinical importance.

O. C. GRUNER

SURGERY

Acute Empyæma Thoracis. Ochsner, A., and Gage, I. M., *Ann. Surg.*, 1931, **94**: 25.

The authors analyze 124 cases of acute empyæma thoracis, and a contrasting study is made of the disease as seen in white and negro patients. The greatest number of cases, 78 per cent, occurred in the second to the fourth decades. The mortality was highest above fifty years of age. As to etiology, 61 per cent occurred after lobar pneumonia and 18 per cent after influenza, while 12 per cent were tuberculous. Other causes were lung abscess and stab wounds. Signs and symptoms in order of frequency were: dullness; pain; cough; limitation of thoracic movement; absence of breath sounds; expectoration; and cardiac displacement. Right- and left-sided empyæmas occurred with equal frequency. The character of the fluid as a prognostic guide was of interest, as follows: purulent fluid in 79 per cent with a mortality rate of 7.3 per cent; serous in 4 per cent with a rate of 20 per cent; and hæmorrhagic in 4.8 per cent, with a rate of 100 per cent.

In treatment, the combination of aspiration with air injection is recommended for a trial in most cases. In this series 21 per cent were treated in this fashion, with improvement or recovery in 80 per cent of the cases in which it was used. The mortality was 10 per cent. Intercostal drainage, used in 30 per cent, resulted in improvement in 80 per cent, recovery in 7 per cent, and death in 12 per cent. Rib resection, used in 39 per cent of the cases reported, gave the following results: improved 79 per cent, recovery 5 per cent, and mortality 13 per cent. The lowest mortality was thus obtained by aspiration combined with air injection.

Acute nephritis was the most frequent complication, representing 22 per cent of all such; 15 per cent developed bronchial fistula. Mortality in the group was 15.3 per cent, in the white patients 10 per cent and in the negro patients 25 per cent. Of the entire group, 82 per cent recovered or were improved.

I. G. MACDONALD

Primary Staphylococcus Infection of the Nose. Lips and Face. Koslin, I. I., *Ann. Surg.*, 1931, **94**: 7.

Well known dangers in the course of apparently trival infections about the face are illustrated by a series of 18 cases. The majority occur between the ages of 40 and 50, and such infections are practically unknown in children under twelve. The mortality in this series was high: six deaths (33 per cent) after an illness of four to twenty days. In all six a positive *S. aureus* blood culture was obtained. Cavernous sinus thrombosis occurred in four of the fatal cases and meningitis in only one case. Only

one showed bronchopneumonia of any note, and metastatic abscesses were absent. All gave definite details of some injury—scratch, abrasion, contusion, etc., or of a "pimple" which in many instances had been disturbed by trauma, cutting or squeezing.

The gravity of these infections is due to the anatomical and physiological peculiarities of the facial and nasal areas. The skin is thin, rich in vascular supply, and in close contact with venous and lymphatic structures. The facial vein, a continuation of the angular, receives tributaries from face, nose and lips. The angular vein communicates with the superior ophthalmic through the supra-orbital fissure and thus to the origin of the cavernous sinus. The facial vein is without valves, patent and non-flaccid. Blood flow occurs with equal facility in either direction. Septicæmia occurs either from thrombo-phlebitis or erosion of a vessel. It occurs more commonly in well-nourished, healthy persons in the "prime of life". Resistance at this age is variable. Immunity to staphylococci is rare. Treatment should be bed rest with warm wet dressings upon the lesion. Express instructions must be given against expression of pus or sloughs from the wound. Above all, incision must never be employed. Ligation of the facial veins should be omitted, by reason of the fear of thrombus formation already existent at the point of ligation.

I. G. MACDONALD

The Nerve Pathways in the Vomiting of Peritonitis. Walton, F. E., Moore, R. M. and Graham, E. A., *Arch. Surg.*, 1931, **22**: 829.

This is purely an experimental study which was undertaken because of the apparent lack of proof that vomiting in peritonitis is really due to irritation of the peritoneum. In a survey of the literature the authors have been unable to find any explanation of the mechanism of vomiting in peritonitis which is supported by experimental facts. Observations made by Walton *et al.*, tend to exclude the probability of either a toxin or a hormone being the causative factor. The emetic stimulus has usually been considered to be a nervous impulse. If this is so the three possible pathways to be considered are the vagi, the sympathetics, and those cerebrospinal nerves which also innervate the peritoneum, namely, the phrenics, the lower six thoracic, the iliohypogastric, and the ilioinguinal nerves.

Intraperitoneal injection of a 24-hour bouillon culture of *B. coli* in twelve normal animals (cats and dogs) produced a fatal peritonitis in each instance, and in all vomiting was a constant feature. These served as controls. Twelve other animals (cats) received similar injections, but were also subjected to bilateral low intra-thoracic vagotomy, performed sixty to seventy-two hours after injection, and differed in no respect from the controls as to vomiting. Bilateral abdominal sympathectomy and splanchnotomy were performed in other animals with similar injections. Vomiting did not differ from the controls. In five animals suffering from a *B. coli* peritonitis with transection of the spinal cord at the level of the second thoracic vertebra, the vomiting was feeble but persistent following this procedure, as the innervation to the abdominal muscles was destroyed. Six animals were allowed to recover following a bilateral low intrathoracic vagotomy. The abdominal sympathetic chains were resected and the splanchnic nerves divided two weeks later. A week later lobeline sulphate was injected intra-muscularly. Immediate vomiting occurred, which showed that the efferent emetic mechanism had not been interfered with. Following the production of peritonitis by *B. coli* injections, every animal died within six days, and post-mortem examination revealed a generalized peritonitis in each instance. Not one of the animals vomited once during the course of the disease. Evidently the emetic action of the peritonitis had been abolished by vagotomy and sympathectomy. Hence the vomiting from peritoneal inflammation is reflex rather than toxic and is the result of stimulation of efferent nerve endings located in the peritoneum. The emetic impulse passes to the medullary centre by way of sensory nerve fibres which are included in both the vagal and sympathetic trunks. This type of vomiting is not abolished by sympathectomy alone or by vagotomy alone, so that the efferent emetic impulse evidently traverses either pathway.

G. E. LEARMONTH

Sarcoma of the Œsophagus. Dvorak, H. J., *Arch. Surg.*, 1931, **22**: 794.

Dvorak reports a case of rhabdomyosarcoma of the œsophagus in a white woman, aged 27, who was admitted to hospital in August, 1929. She gave a history of gastric disturbance extending over a period of six years, and had twice during the past two years been under observation in this hospital, but no gastric lesion had been demonstrated. In 1928 she had complained of a tight feeling in her throat at the level of the jugular notch. Six months later this symptom had become more pronounced and she first noticed difficulty in swallowing. Two months later she was unable to swallow anything. During the six months previous to this time she had lost 40 pounds in weight. Examination by means of an œsophagoscope revealed a tumour of which a small portion was removed for pathological examination. The lesion was diagnosed as spindle-cell sarcoma with giant cells. Gastros-

tomy was performed and after this radiation treatment was instituted. The lesion was described as "a large necrotic tumour mass which bleeds easily and appears to spring from the left anterior œsophageal wall 20 cm. from the incisor teeth, causing about 75 per cent obstruction of the lumen of the œsophagus. The mass is partially covered by a white membrane". The mass was palpable on the left side of the neck just below the larynx. Roentgenograms showed a malignant condition of the œsophagus beginning at a level corresponding to about the 2nd or 3rd dorsal vertebra, and extending downward for about 4 cm. The œsophagus was displaced to the right by the mass. The patient died. Pathological examination showed the constituents of the tumour to be predominantly spindle cells; some multinucleated giant cells, some round cells, fibrous connective-tissue, and a liberal sprinkling of muscle cells. The histological picture was that of a rhabdomyosarcoma of the œsophagus. Only thirty unquestioned cases of sarcoma of the œsophagus have been reported in the literature whilst this is the third reported instance of rhabdomyosarcoma of the œsophagus.

G. E. LEARMONTH

Primary Isolated Lymphogranulomatosis of the Stomach. Singer, H. A., *Arch. Surg.*, 1931, **22**: 1000.

Heretofore Hodgkin's disease has not been classed as a surgical disease, due mainly to the unfavourable end-results when surgical intervention has been attempted. Of late years, a number of patients with isolated lymphogranulomatosis of the gastro-intestinal tract have had a radical resection performed, generally under a mistaken clinical diagnosis. So favourable have been the results that the question of non-operative interference must be reconsidered. Steindl reported the first case of strictly isolated lymphogranulomatosis in 1924, where the pre-operative diagnosis was carcinoma of the stomach. An infiltrating tumour was found involving the pyloric and pre-pyloric regions, with a number of enlarged glands in the adjacent lesser omentum and in the gastro-colic ligament. No other lesions were found at operation. One year later there was no evidence of recurrence or the development of other foci.

The author reports a case of granulomatosis of the stomach, which he believes is the only one in which a careful clinical history and a gross and microscopical study of the tissues obtained at necropsy showed that the disease was limited to the stomach and perigastric lymph glands. The patient was a white male, aged 62 years, who entered Cook County Hospital on June 30, 1928. Twenty months previously he noticed a burning pain in the left hypochondrium, which regularly appeared at 4 p.m., lasting until the evening meal. Because of the distress continuing for seven months cholecystectomy and appendicectomy were performed. These operations gave him no relief; instead he developed pain one-half to four hours after his meals. Under the Sippy treatment there was some improvement. He was relatively symptom-free for three months, when epigastric pain and later on vomiting occurred, and he lost in weight. X-ray examination of the stomach showed a constant annular deformity of irregular density and contour involving the pars pylorica and the distal part of the pars media, which was considered evidence of carcinoma.

At operation a semi-elastic tumour, involving the distal third of the stomach, and a number of enlarged perigastric glands as large as hazel nuts were found. A gastro-enterostomy was performed to which the patient succumbed. At post-mortem examination the stomach was greatly enlarged, owing to dilatation in the proximal two-thirds. The distal third was not distended, but contained a soft, somewhat elastic infiltration proximal to the pyloric ring on the greater and lesser curvatures. On opening the stomach a tumour occupied the distal third of the stomach and had produced a marked thickening of the wall. The lining of the infiltrated part of the stomach was extensively ulcerated. The ulcers were for the most part superficial and irregular in outline with sloping edges. The ulcer bases did not extend below the niveau of the normal mucosa. Cross-section of the stomach showed a marked increase in thickness. The lymph glands in the gastro-hepatic omentum were increased in size. The tissue of these glands was the same as that referred to in the stomach. The morphological details were the same as those found on microscopical examination of Hodgkin's disease elsewhere. Numerous Sternberg-Reed giant-cells were present.

In the present state of our knowlege it is impossible to diagnose isolated gastric lymphogranulomatosis unless by histological examination of the tumour.

G. E. LEARMONTH

OBSTETRICS AND GYNÆCOLOGY

Rational Methods of Treatment of Asphyxia of the New-Born. McIlroy, L., *Practitioner*, 1931, **126**: 598.

The survival of an infant very often depends upon the care which is taken of it for the first few minutes or hours after birth. Physiological methods deserve general consideration and should supersede the older practices. At birth the normal child is in a state of apnœa (no pulmonary respiration but with sufficient oxygen in the blood to maintain life for a time), but this is only momentary, as pulmonary respiration is immediately established. If

there is delay in the first respiration, it is in a state of anærosis (deprivation of air); if this persists, a condition of asphyxia (pulselessness) is the consequence. During labour the CO_2 content of the fetal blood is raised. This is essential for stimulation of the medullary respiratory centre so that respiration may take place immediately after birth when the umbilical circulation has been cut off. Oxygen is also required for the continuance of cardiac function and for the establishment of respiration. The uterine contractions and pressure in the pelvis may prevent fluid from blocking the air passages. If there is prolonged pressure the CO_2 may exceed the physiological amount and death of the fetus during labour may ensue, or the lack of adequate oxygen may prevent the establishment of pulmonary respiration after delivery. Intra-cranial injuries are important factors in the causation of asphyxia by direct injury to the medullary centre, so that the infant is born dead or respiration may be established for a short time and then cease with defective aeration of the lungs (atelectasis).

If the infant shows cyanosis after delivery (asphyxia livida) the mucus catheter should be employed to suck out mucus. Air should not be blown into the lungs as there is danger of over-pressure upon the alveoli and also sepsis from the practitioner's breath. If respiration does not occur, a mask with CO_2 5 per cent and oxygen 95 per cent is placed on the infant's mouth at intervals of about 16 times per minute. As a rule, respiration becomes established in a few minutes. The cord is cut and induced to bleed as this helps the congestion of the heart. No artificial respiration involving movement of the head or spine is employed and no baths of cold or warm water are given. If breathing is unduly delayed give 1 c.cm. of lobelin subcutaneously. Gentle massage of the heart or compression of the ribs may be carried out. If respiration still fails to become established use tongue traction. If the infant is born in a condition of shock (asphyxia pallida) it is handled in the same way, except that some cardiac stimulant is given hypodermically, such as camphor, strychnine or cardiazol. It is useless to attempt artificial respiration until the circulation is improved. The infant is given absolute rest and warmth. CO_2 and oxygen are applied by means of the special apparatus and oxygen alone as soon as respiration takes place. Nitrous oxide and oxygen is preferable to ether or chloroform as an anæsthetic during late labour and delivery, as the N_2O can be withdrawn and the oxygen administered. This is especially useful when the resuscitating apparatus is not available. When complete expansion of the lungs is delayed the infant must be treated with care. Warmth is essential. Oxygen should be given if there are signs of atelectasis. The carbon dioxide and oxygen apparatus has proved its value beyond doubt. It can also be used in case of anæsthetic collapse or gas poisoning.

ROSS MITCHELL.

How to Reduce Maternal Mortality. McIlwraith, K. C., *Can. Pub. Health J.*, 1931, **22**: 347.

This is a paper presented to the Academy of Medicine of Toronto by the chairman of its committee on maternal welfare. When comparing our maternal mortality statistics with those of European countries it should be remembered that the latter deal in each instance chiefly with a single race living in its accustomed environment, while we must deal with many races striving to live and reproduce in an unaccustomed climate and circumstances. This doubtless accounts in part for our unfavourable statistical showing. Under pre-natal care, Dr. McIlwraith suggests that victims of heart disease, chronic nephritis, tuberculosis and diabetes should be "restrained from maternity", and venereal disease should be completely cured "before pregnancy is tried." Patients who carry out prenatal instruction and enter hospital for confinement show no mortality from eclampsia and albuminuria of pregnancy. Foci of infection in the familiar situations are sometimes responsible for maternal death and should be eliminated before labour is due. Expectant mothers should be protected from all communicable diseases. Contracted pelves, malpositions and tumours of the uterus should be detected early and indicated measures planned for in advance. Anæmia demands appropriate treatment. Pernicious vomiting is so menacing a condition that it should have a specialist's treatment in a well equipped hospital. As for natal care, hospitalization has its risks as well as its advantages; it also, may be too expensive, and may not be available. Primiparæ and complicated and operative cases should go to hospital; multiparæ may be just as safely cared for at home if good technique is practised. All persons in attendance at labour should wear masks (four thicknesses of gauze) covering mouth and nose, to guard against the infection of the patient by *S. hæmolyticus*. The mask should be worn while dressings are being changed for four days after birth. Should infection follow perineal repair, no further repair should be attempted until the temperature has been normal for at least a fortnight. Difficult operations should be attempted only where there are good facilities and competent operators. Shock and hæmorrhage are "too often due to premature or otherwise unskilful use of forceps, versions, or manual placental removal."

Twenty per cent of the maternal deaths in Ontario are due to eclampsia. Death from this

condition is rare in the hospital clinic. Why should it not be equally rare in ordinary practice?

W. H. HATTIE

Treatment of Habitual Abortion with Wheat-Germ Oil (Vitamin E). Vogt-Moller, P., *The Lancet,* 1931, **221**: 182.

The existence of a fat-soluble antisterility vitamin (vitamin E) is accepted and the experimental work leading to this view is briefly summarized. The author's own work is confirmatory of the findings of other investigators. Favourable results have been obtained in the treatment of sterility in cows. The treatment of habitual abortion in women by cod liver oil and Vigantol is contraindicated upon an experimental basis, but the use of vitamin E has given more favourable results. Two cases are cited in which young women who had aborted four and five times respectively were treated with wheat-germ oil from the sixth week of pregnancy to term. Neither had any discoverable cause for the repeated abortions. Both were delivered of normal children after a normal gestation period. There was no actual lack of vitamin-containing foods in the dietary during the abortion periods, but it is suggested that the vitamin requirements of different individuals may have accounted for a relative avitaminosis. It is suggested that vitamin E may be of therapeutic value in habitual abortion.

J. B. ROSS

OPHTHALMOLOGY

Simple Detachment of the Retina. Doggart, J. H. and Shapland, C. D., *Brit. J. Ophth.*, 1931, **15**: 257.

Professor Gonin began to publish his opinions on the pathology of simple detachment of the retina more than twenty-five years ago, and for the past eight years has been successfully operating on a high proportion of his cases, but it is only recently that his method has attracted world-wide attention. Simple detachment of the retina means partial or complete separation of the layer of rods and cones from the retinal pigment-cell layer, arising either spontaneously or as the apparent result of some minor trauma to the globe from direct or indirect violence. Gonin believes that simple detachment is produced by the passage of fluid from the vitreous into the retinal space through one or more holes in the neural layers of the retina, and that the closure of these holes is essential for cure. The importance of holes in the production and maintenance of simple detachment of the retina was recognized by Leher, Nordenson, and others before Gonin, and ignipuncture was in use before the beginning of this century, but Gonin's great achievement consisted in devising a method of applying ignipuncture to the hole itself with a view to sealing it. The differential diagnosis between simple and other varieties of detachment is described in the standard text-books. Whenever the diagnosis of simple detachment is made, the condition of both eyes is investigated; vision, visual fields, the state of the iris and of the media must be noted, and observations made upon the shape, size and situation of the detachment, as well as upon any landmarks in its neighbourhood. The fundi are explored with the aid of mydriasis and a search made for the hole or holes in the retina. These may be difficult to detect, especially in long-standing cases. Various types of holes are recognized; such as the arrow-head shaped, the horse-shoe shaped, the rounded punched-out, festoon-shaped, and irregular. The operation, as performed at Moorfields, is described in detail, and also the after-treatment. The article concludes with a number of illustrative cases.

During the year 1930, 75 cases of retinal detachment were submitted to the operation of cautery puncture by Gonin's method at Moorfields. Of these, 24 were discharged with the retinal detachment back and the visual field full; 12 showed improvement either in the visual field or visual acuity; the remaining 39 were unchanged or made worse. To obtain 32 per cent of cures and 16 per cent of improvements in such a serious and hitherto almost hopeless condition is indeed striking, especially as the method was an entirely new one, and but little attempt had been made to select cases during the first six months of the year.

S. HANFORD MCKEE

On a Form of Central Retinitis of Angioneurotic Origin. Horniker, E., *Arch. f. Ophthal.*, 1930, **123**: 286.

In this article Horniker writes on a form of retinitis, through a series of cases, which he believes is not so rare as one might think from the scant notice which it receives in the literature. The inflammation is confined to the macula and surrounding areas and is best studied with red-free light. Punctate opacities in the lens and degenerative changes on the back of the cornea occur so regularly in these cases that Horniker considers that their presence indicates, thus, changes in the retina. The patients, who were mostly between thirty and forty years of age, invariably showed signs of an angioneurotic diathesis. Horniker believes that the changes are the result of some circulatory disturbance in the terminal vascular zone, at the macula, and that the disease is an expression of a pathological reaction in the blood vessels, based on an inherited constitutional idiosyncrasy. The most prominent symptom is sudden impairment of vision, which varies considerably in degree and is

often followed by headache. The changes found at the macula are œdema, hæmorrhages, and Gunn's dots. Various changes in the vessels are described and the prognosis is stated to be good, though relapse may occur.

S. HANFORD MCKEE

The Eye in the Tuberculous Patient. Goldenburg., M. and Fabricant, N. D., *Arch. Ophth.*, 1931, **5**: 66.

According to this survey (1) tuberculosis of the eye is encountered much less frequently than the literature would have one believe. (2) Of a total of 1,073 cases, only 7 showed pathological changes in the iris, giving a percentage of 0.65. Only 3 of these could be seriously considered as tuberculous, giving a percentage of 0.27. (3) Of the 914 cases in which the fundus was examined, 78 showed deviation from the normal; only 19 of these can be seriously considered, giving a percentage of 2.08. (4) Of these 19 cases, 18 were unilateral, and 1 bilateral, the latter probably of doubtful origin. (5) Tissue changes, as the result of a so-called tuberculous toxæmia, were not disclosed in this survey, unless one considers the bleaching of the pigment as such. (6) Tuberculosis of the eye is in all probability the result of the localization of an embolic focus of the tubercle bacillus, which can take place only through the blood stream.

S. HANFORD MCKEE

NEUROLOGY AND PSYCHIATRY

The Vibration Sense in Post-Encephalitic Parkinsonism. Worster-Drought, C., and Hill, T. R., *J. Neurol. & Psychopath.*, 1931, **11**: 318.

The authors present the result of their investigations of the vibration sense in a series of cases of post-encephalitic Parkinsonism. They made use of the method devised by Symns and checked the results with normal controls. The vibration sense is taken to mean the ability to appreciate the vibrations of a tuning-fork when the base of the fork is placed firmly on a bony surface of prominence. There is considerable difference of opinion as to the nature of this particular "sense", but the majority of views coincide with those enunciated by Head and Holmes. There is a close correlation between vibration sense and the ability to recognize passive movements—the former depending essentially upon an orderly succession of minute passive movements. Both types of sensation are transmitted upward in the posterior columns of the cord. Directions for obtaining the measurements are given and Symn's table of average figures for normal individuals is submitted. The authors in examining a group of 25 cases of generalized post encephalitic Parkinsonism found the vibration sense regularly and uniformly reduced by from 10 to 13 seconds at the various points tested. No period of lengthening of appreciation of vibration was found. They feel that finer tests of sensory function than have usually been employed would modify the existing opinion that post-encephalitic Parkinsonism is essentially a motor disorder. The explanation of the diminution noted is thought to be some degree of thalamic depression due to the encephalitic infection. A. T. MATHERS

Menopause and Psychosis. Farrar, C. B., and Franks, R. M., *Am. J. Psychiatry*, 1931, **10**: 1031.

In this analysis of two years' experience at the Toronto Psychiatric Hospital, the authors find no justification for "the age old tradition which unduly exaggerates the morbific potential of the climacteric". Of 739 female patients (of all ages) admitted, 168 belonged to the 40-55 age group. Of these 168, 61 are classed as climacteric cases, having developed within the two years preceding or following the onset of the menopause. In 37 of these cases (60.6 per cent) the first evidences of both menopause and psychosis became apparent within the same year. None of the psychoses represented in the group are limited to the climacteric period. In somewhat more than one-fifth of the patients there had been previous evidences of mental disorder. To the authors it seems clear that "of those presenting notable mental abnormalities the great majority exhibit preclimacteric psychotic potential." The relationship of the "biological situation of the menopause" (*e.g.*, endocrine, vasomotor and metabolic changes) to concurrent mental phenomena is unknown. The age factor, sometimes made evident by characteristic mental and physical signs, is most commonly inconspicuous or absent. Changes in the life relationship of the individual are such that the psychosis is frequently "to be regarded as largely reactive to such external circumstances". The dread in which the menopause is so commonly held by women is sometimes sufficient to lead to troubles for which the menopause as such is not primarily responsible. "While the menopausal psychoses as a unitary classification have disappeared from the text-books, the dread of them remains, to counteract which it is the profession itself which must take the lead in promoting a more wholesome mental-hygiene outlook upon what is, after all, among women a universal phenomenon." W. H. HATTIE

Socio-Psychiatric Research. Sullivan, H. S., *Am. J. Psych.*, 1931, **10**: 978.

In this vigorous and delightfully discursive paper Sullivan gives voice to dissatisfaction with prevailing conceptions in the psychiatric world.

He deals particularly with schizophrenia, and foresees usefulness for his teaching in the treatment of this condition and in the field of mental hygiene. That for which he contends has the merit of great simplicity. He would relieve us of the boredom of psycho-analysis and of the strain upon credulity entailed by the subsequent "interpretation". In a study of "social recoveries", Sullivan became convinced that patients were often released from institutions because they had "integrated enough of the personal environment to realize the prejudice opposed to their delusions. It seemed almost as if they grew wise enough to be tolerant of the imbecility surrounding them, having finally discovered that it was stupidity and not malice". Certain people have a peculiar fitness for dealing with schizophrenic patients, and Sullivan's endeavours to discover the characteristics of this singularly useful personnel foreshadowed his conclusion that personality reorganization may obtain in a sympathetic personal environment. Personality reorganization is manifested as a "broadening, a deepening, or both, of interest in interpersonal relations", and is seemingly to be accomplished by a truly sympathetic endeavour to build up and strengthen relatively undeveloped tendencies to inter-personal relations. Our author has had such success in the application of this theory that he anticipates a great increase in the institutional recovery rate by "psychiatrically intelligent" control of the personal environments of acutely schizophremic persons. But as they are likely to return too soon to their former disturbing environments, there will be a corresponding increase in the relapse rate. In time, however, proper provision will be made for convalescents, and socio-psychiatric communities will be established as a great factor in mental hygiene, "with a great reduction in the incidence of major mental disorders, at least of the schizophrenic type."

W. H. HATTIE

THERAPEUTICS

Taboparesis Treated by Hyperpyrexia Induced by Hot Baths. Gibson, C. R., and Gordon, R. G., *Brit. M. J.*, 1931, **1**: 1015.

A further whet to the interest in the newer methods of treatment of neurosyphilis is afforded by this paper. It is pointed out that Foster reported beneficial effects from malaria on insanity as far back as 1848. Present interest, however, dates from Wagner-Jauregg's publication of his claims for the systematic treatment of general paralysis by induced malaria in 1917. Doubt still exists as to whether the results of malarial treatment depend on some specific effect of the plasmodium or its toxins, or upon the hyperpyrexia. If due to the hyperpyrexia alone, there are obvious reasons for preferring physical means of induction. The work of Mehrtens and Pouppirt, of San Francisco, suggested the trial of the hot bath treatment here recorded. A case of taboparesis is reported, in which no treatment other than hot baths (106° to 107°) was used, and in which much improvement was obtained. The principal danger is from dehydration, on account of profuse sweating. This may be obviated by giving fluid per rectum before the bath is entered, and by its subsequent administration by rectum or subcutaneously, should the need arise. A graphic record of the rectal temperature while the patient is in the bath is desirable. Should this not be feasible the mouth temperature should be taken at frequent intervals. The patient remains in the bath for forty minutes or more. Considerable distress is occasioned—rapidity and shallowness of breathing, perhaps with cyanosis, singing in the ears, headache, light-headedness. These symptoms are seldom severe enough to require cessation of the bath before the expiry of fifty minutes. When the patient leaves the bath, the body temperature is 105 to 106°. Some hours elapse before it is again normal. The loss of weight from perspiration is usually 3½ to 4½ pounds. This is quickly made up. The treatment need not interfere with the patient's work.

The reviewer remembers that, in the early enthusiasm for hydrotherapy in hospitals, several observers thought that cases of general paralysis were frequently benefited, but they were chary about publishing their opinions.

W. H. HATTIE

The Case for and against the Operative Treatment of Angina Pectoris. Yater, W. M. and Trewhella, A. P., *Am. J. M. Sci.*, 1931, **182**: 35.

The authors discuss the cause of angina pectoris and the value of the various surgical methods devised for its relief. They champion Daniélopolu's theory that angina pectoris is caused by inadequate coronary circulation, whether as a result of disease of the coronary arteries or not. It is pointed out that perfectly normal coronary vessels may be faced by an excessive demand which explains the occurrence of the syndrome in very active young adults. The spasm theory is brushed aside as unworthy of consideration. They have collected and analyzed the results of the operation of cervical sympathectomy upon 138 cases of angina pectoris. The operation was not the same in all cases. In some instances (21) removal of the cervical ganglia and the first thoracic or stellate ganglion was carried out. In others only the superior cervical ganglion was removed. In other instances the nerves from the ganglia were resected. Some of the operations were bilateral while others were not. Of the 126 cases in which

some form of cervical sympathetic ganglionectomy was performed 40 per cent obtained complete relief, 29 per cent obtained partial relief, and 27 per cent obtained no relief at all. These percentages also held true when all types of operations for relief of pain were included. Thirty-three patients died at or not long after the operation. In many instances in which the anginal symptoms were relieved other types of pain made their appearance. One of the most common of these was pain in the side of the face, jaw or neck. Some had severe pain in the jaw when chewing. In others severe "brachial neuralgia" occurred.

The authors sum up the evidence against operative treatment of angina pectoris by pointing out that (1) no relief or only partial relief occurs in 53 per cent of cases; (2) that new pains, paraesthesias, and other evil complications follow operation in 31 per cent of cases; (3) that the expectancy of life is not increased, and finally (4) about the same proportion of cases obtain relief by the use of nitrites or by paravertebral nerve block.

E. S. MILLS

HYGIENE AND PUBLIC HEALTH

The Relation Between Changes in Nationality Stock and Increasing Death Rates in Adult Life. Winslow, C.-E. A., and Wang, P. L., *Am. J. Hyg.*, 1931, **14**: 79.

For several years past American statisticians have been calling attention to a rising mortality rate at ages above 45. As certain immigrant groups exhibit mortality rates quite different from those of the native born, it has been suggested that the increasing rates in adult life may be due, in part, to changes in immigrant stocks. The authors present a study undertaken to determine if this factor is of importance.

The statistics of population and death of six states (Connecticut, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island) for the period 1890-1920 were subjected to analysis. During this period there was little change in the proportion of either foreign-born or native-born of foreign parentage to total population, but in the character of the immigrant nationality stock there was a radical change. In 1890, those of Irish, German, Italian and Russian nativity comprised 33, 23, 3 and 3 per cent, respectively, of the foreign born population; in 1920 these percentages were 11, 8, 17 and 24. By dividing the population into (1) native-born of native parentage, (2) native born of foreign parentage, and (3) foreign-born, and subdividing each of these groups by age periods, the authors obtained data from which interesting conclusions, relative to the six states under study, are drawn. These may be summarized as follows: (1) for each decade of life after 40, the mortality rate is approximately double that of the preceding decade; (2) the rate of increase is essentially the same for the native-born of native parentage as for the whole population; (3) the foreign-born differ from the rest of the population in showing a sharp decline in mortality, which became manifest in 1890, 1900 and 1910 in the fifth, sixth and seventh decades respectively, and which may be due to replacement of Irish and German stocks, characterized by high mortality, by Italian and Russian and other stocks characterized by low mortality; (4) the native-born of foreign parentage differ from the rest of the population in showing a disproportionately sharp increase in mortality between 1905 and 1915, when the effect of substitution of Irish and German stock for the previously predominant English stock would appear to be the explanation. If these conclusions are correct, the authors expect a stabilization of the rates among the foreign-born at ages under 50, a decrease among the native-born of foreign parentage as the Italian and Russian elements become dominant in this group, and an increase among the native-born of native parentage as the third generation of Irish and German stocks pass on into middle life.

W. H. HATTIE

Neuropathology Resulting from Comparatively Rapid Carbon-Monoxide Asphyxia. Chornyak, J. and Sayers, R. R., *Pub. Health Rep.*, 1931, **46**: 1523.

It is generally taught that carbon-monoxide exerts its effect on the body solely by virtue of its great affinity for hæmoglobin. A relative anæmia is produced when individuals are exposed to CO, and, depending on its concentration and the time of the exposure, this anæmia may be severe or mild. If an individual has 60 per cent of his hæmoglobin saturated with CO he is in the same position as a man with 40 per cent of available hæmoglobin. Individuals who have been exposed to CO and who have been severely poisoned thereby may survive the episode of poisoning and eliminate all the CO from their blood and yet not regain their previous health. The explanation of this is that during the period of acute poisoning the temporary anæmia produced has damaged some of the tissue cells to a varying degree.

The article under review describes the effect of CO intoxication on the nervous system of dogs, and lends support to the belief that this effect is due to anoxæmia rather than to a specific toxic effect of the CO. Dogs were exposed to 0.6 per cent of CO in air for 20 to 30 minutes (a fatal exposure), and their brains were then examined. They showed on the whole

a severe perivascular and perineuronal œdema. This was most marked in the corpus striatum, the cortex, and the dorsal motor nucleus of the vagus nerve. The vessels were greatly dilated and tightly packed with red blood cells. Stasis was marked throughout. There were a few petechial hæmorrhages, especially in the corpus striatum and cortex. Most of these were not larger than would occur by diapedesis through the dilated vessels. Occasionally, a few leucocytes, both lymphocytes and polymorphonuclear leucocytes, were found in the perivascular spaces. The endothelium of the capillaries appeared to be swollen in some areas.

The following conclusions are drawn.— The circulatory changes are characterized by dilatation, stasis, perivascular hæmorrhage, and œdema. Œdema is diffuse and severe. It is both perineuronal and perivascular. There is a marked difference in the susceptibility of the nerve cells to oxygen deprivation. The cells of the cortex, corpus striatum, dorsal motor nucleus of the vagus, and the dorsal sensory areas of the medulla, are the most sensitive. The nucleus ruber, nuclei of the oculomotor, trochlear, abducens, and facial nerves, and the large polygonal cells in the reticular formation of the medulla are the least susceptible. There are two general types of degenerative changes in the nerve cells following asphyxia: (a) some become shrunken and stain diffusely; (b) others show varying degrees of chromatolysis. Carbon monoxide produces a diffuse degenerative change throughout the entire brain. In this type of asphyxia the most serious effect appears to be œdema of the dorsal motor nucleus of the vagus and the adjacent area in the medulla oblongata.

FRANK G. PEDLEY

Diphtheria Prevention in Detroit. Vaughan, V. F. and Buck, C. E., *Am. J. Pub. Health*, 1931, **21**: 751.

Because of the desire for the greater cooperation of practising physicians, and because it is not reasonable to expect the community to supply all the services necessary to insure universal participation in the field of preventive medicine and health promotion, the Department of Health of Detroit decided, in 1928, upon a cooperative plan. An agreement with the local medical society provides that physicians will make Shick tests at one dollar each, and administer toxin-antitoxin at fifty cents per treatment, with the understanding that no charge will be exacted of those unable to pay. All tests and treatments are reported immediately on postage-collect cards. Eighty-five per cent of the physicians of the city have subscribed to the agreement. The Department provides the materials for tests and treatments, carries on educational work through newspapers, posters, lectures, radio talks, letters to parents and visitations by public health nurses, and pays doctors for the work done for children whose parents are unable to pay. The result has been a notable increase in interest on the part of both the profession and the laity, and a substantial increase in the number of immunizations.

W. H. HATTIE

RADIOLOGY

Kummell's Disease with Report of a Roentgenologically Proved Case. Rigler, G. G., *Am. J. Roentgenol.*, 1931, **25**: 749.

Rarefying osteitis of the vertebral body, secondary to minor trauma, is called "post-traumatic spondylitis", "post-traumatic vertebral collapse", "post-traumatic spondylomalacia", and many other things. The text gives short descriptions of various author's discussions of the subject and indicates that only by immediate and frequent subsequent roentgen examinations may the diagnosis be soundly established. The greatest criticism of the condition as an entity comes from those who believe that all these cases are undiagnosed fractures of the vertebræ. The particular case recorded was x-rayed two months after injury and showed at that time a fracture of the 5th cervical and 12th dorsal vertebræ. Nine and one-half months later, in spite of suitable support, there was found marked narrowing of the 7th and 9th dorsal vertebræ, which had previously been healthy. This demonstrates how long a period may elapse before the changes of Kummell's disease become obvious. Each case of spinal injury should be carefully examined by x-ray, no matter how slight the trauma and prognosis should be most guarded, because even if one or more vertebræ are obviously fractured others, though apparently normal at the first examination, may later develop compression and this will add greatly to the disability.

A. STANLEY KIRKLAND

Osteitis Fibrosa Cystica Generalisata with Hyperparathyroidism as Etiology. Dresser, R. and Hampton, A. O., *Am. J. Roentgenol.*, 1931, **25**: 739.

The diagnosis is usually established by x-ray, therefore the roentgenologist should be especially familiar with the findings. The disease occurs chiefly between the ages of 30 to 60 and more frequently in women. Pain, muscular weakness, postural abnormalities, spontaneous fracture and a loss of weight due to loss of lime in the bones are common symptoms. The calcium metabolism is disturbed. The blood serum calcium content is elevated and serum inorganic phosphorus is low. The urine shows an increased content of both, causing polyuria and

frequency. Kidney stones are frequently found and pyonephrosis may be a complication. Paraplegia follows softening and mushrooming of the vertebral bodies. The work of Erdheim, Hoffheinz and Collip is reviewed and the classic experimental surgery of Mandl, who first transplanted foreign parathyroids into the body of a case suffering from osteitis fibrosa cystica with no relief, and subsequently removed a tumour of the parathyroid with early improvement, is detailed.

Case reports are presented with descriptions of the pathology and roentgen findings. It is concluded that even if no tumour can be palpated, if the patient presents the roentgen picture described and shows, at the same time, an elevation in the blood calcium and a decrease in blood phosphorus, an exploratory operation is warranted. The successful extirpation of the parathyroid tumour is followed by remarkable clinical improvement. The removal of normal parathyroid tissue is to be avoided if possible.

A. STANLEY KIRKLAND

ANÆSTHESIA

Spinal Anæsthesia in Abdominal Surgery. McKittrick, L. S., McLure, W. L. and Sweet, R. H., *Surg., Gyn. & Obst.*, 1931, **52**: 898.

Spinal anæsthesia was used by the authors in a series of 415 cases in whom the age-incidence was between 10 years and 80. Most of the operative procedures were within the abdomen. Ephedrine sulphate, 50 milligrams, was given to each patient prior to the injection of the anæsthetic.

Spinocain was used first in a few cases, but was discontinued because of its uncertainty, due to delays in anæsthesia and in one or two instances a complete absence. In the majority of the cases 100 to 200 milligrams of procaine hydrochloride crystals were used. The duration of anæsthesia was variable; it usually lasted from one hour to one hour and a quarter in the upper part of the abdomen. Two and two-fifths per cent of the series required some form of supplementary anæsthesia during the first hour. Ten and four-fifths per cent required a general anæsthetic for the completion of the operation. As opposed to this, 66 per cent of 85 operations which lasted 1½ hours or more required no additional anæsthesia.

Ten and four-fifths per cent of the series had a fall in blood pressure of 50 per cent or more during the operation. This apparently bore no relation to the amount of procaine used, nor to the height of the anæsthesia, nor to the pre-operative level of blood pressure. Hypertension (a systolic blood pressure of 150 or over) was present in 12 per cent of the series. In this group, it was noted that 47 per cent of the patients had not regained the pre-operative level of blood pressure within 20 hours after operation. There were 33 patients in the series with hypotension (a pre-operative systolic blood pressure of 100 or less, not due to shock). In 11 cases, the blood pressure rose after the injection of anæsthesia, and in only 5 cases was there a fall of 50 per cent or more. The time necessary for recovery of blood pressure in this group is in contrast to the hypertension group, as of the 18 cases followed all had regained or exceeded the pre-operative level of blood pressure within 30 minutes after operation.

Post-operative sequelæ due to the spinal puncture were absent. There were 6 cases of headache, only one of which was severe. Complications of the respiratory system accounted for 40 per cent of those occurring,—a higher percentage than that in a similar series with general anæsthesia, and also higher than that which occurred in the same service the previous year under general anæsthesia. There were 13 cases of pneumonia, with 6 deaths. Two of these had upper respiratory tract infections previous to operation, and two had ether to supplement. Among the 338 cases whose record was carefully followed there were 40 deaths. The majority did not bear any relation to the type of anæsthesia, but in a few the anæsthetic falls under suspicion. Five patients died suddenly within 48 hours of operation. Four of these died in a similar way, apparently of acute pulmonary œdema. The fifth case died of shock. In none of these cases was the rôle of the anæsthetic very clear, but nevertheless, the deaths occurred suddenly and unexpectedly. One death, which occurred during operation, seemed directly due to spinal anæsthesia. It was most satisfactorily explained by a paralysis of the accessory muscles of respiration.

In conclusion, the authors raise the question as to whether in the light of these results one would be justified in using spinal anæsthesia with the expectation of preventing pulmonary complications. They point out that in this series there is no evidence to show that the number of these complications is decreased by this type of anæsthesia.

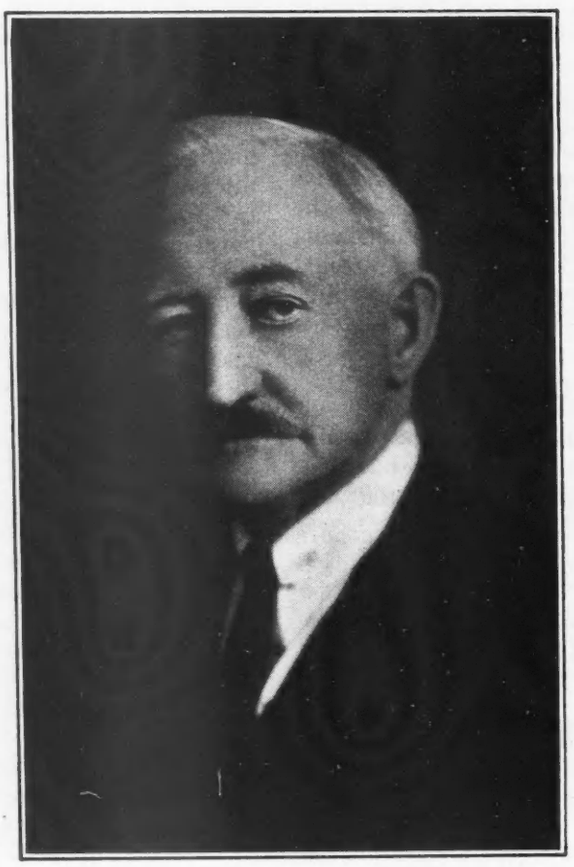
DOROTHY M. TEGGART

THE EFFECT OF COOKING ON THE DIGESTIBILITY OF MEAT.—Raw meat is digested *in vitro* much more slowly than cooked meat. Over-cooked meat is very slowly digested as compared with underdone meat. The maximum rate of digestion is obtained with underdone roast meat. Re-warmed underdone meat does not diminish its digestive rate. Re-heating with consequent over-cooking diminishes the rate of digestion. The rate of digestion of meat (raw or cooked) is the same whether trypsin alone be used or pepsin followed by trypsin.—W. M. Clifford, *Biochem. J.*, 1931, **24**: 1728.

Obituaries

"Know ye not that there is a prince and a great man fallen this day—"

Dr. Samuel Willis Prowse died suddenly on August 1st in the Winnipeg General Hospital from a heart attack. He had been seriously ill on two or three occasions before, but death came unexpectedly. He was born at Murray Harbour, Prince Edward Island, on August 25, 1869, his father being Senator Samuel Prowse. He received his Arts training in Mount Allison University, New Brunswick, graduating B.A. (1889). He then proceeded to Edinburgh to enter the study of medicine and graduated M.B., Ch.B. in 1893; M.D. in 1896, and F.R.C.S. (Edin.) in 1898. He practised at Colinsburgh, Fifeshire from 1894 to 1898 when he moved to Winnipeg, at a time when Canada was beginning a most remarkable period in her development. After a year in general practice he restricted himself to diseases of the eye, ear, nose and throat, and came to be recognized as one of the leaders in that specialty in the Dominion.



Dr. Samuel Willis Prowse

In 1902 he became associated with the Manitoba Medical College, first as a lecturer in physiology and later in his chosen department. In 1910 he was elected President of the Winnipeg Medico-Chirurgical Society. In 1916 he organized and took to France No. 4 Casualty Clearing Station, a unit which represented Manitoba Medical College. In 1917, while in France, he was appointed Dean of the Medical College in succession to Dr. H. H. Chown. On his return, the Manitoba Medical College, which had up to this time been an independent institution, though affiliated with the University, turned over to that body all its property and equipment and became the Faculty of Medicine of the University of Manitoba.

In 1924 Dr. Prowse was honoured at a public dinner given to recognize his remarkable services as Dean. Largely as a result of his efforts the School had been rated as Class A. At this time it was announced that friends of the institution had provided a fund of $5,000 from which a Prowse Prize was to be awarded annually for original research work. Up to the time of his death the welfare of the Medical School lay closest to his heart.

Almost from the time of his arrival in Winnipeg he was associated with the Winnipeg General Hospital and at the time of his death he was head of the Department of Oto-laryngology.

Dr. Prowse was a member of the Royal Society of Medicine and of the Ophthalmological Society of the United Kingdom and a Fellow of the American College of Surgeons. At the 1930 meeting of the British Medical Association in Winnipeg he was Vice-President of the section of Oto-Laryngology, and was one of those honoured with the degree of Doctor of Laws by the University of Manitoba. He was a member of the Council of the Canadian Medical Association and was deeply interested in the work of the Medical Council of Canada.

In addition to high professional qualifications Dr. Prowse possessed a singular courtesy of manner and dignity of bearing. He was particularly interested in the welfare of young people and medical students and recent graduates, as well as his colleagues, will feel that they have lost a true friend and a wise leader.

He is survived by a daughter and a son.

APPRECIATIONS

For those who have known Dr. Prowse as Dean of Faculty, physician and friend the story of his life needs no interpreter. For almost a generation Dr. Prowse's presence in any group has represented the traditional qualities of heart, mind and deportment of the good physician, and the memory of his kindness will outlive even the record of his achievements. In those long lines of Presidents and Deans of Faculty, extending to the earliest schools of medicine, in the lists of those who have been the chosen representatives of medicine in their own age and country, among all the marbles in the crowded corridors of medicine's hall of fame, there is room and place for the name and likeness of one whose life and speech and features were cast in the mould of nobility of service. We who were his friends will remember Dr. Prowse all the days of our lives and the College of Medicine and the annals of medical education will perpetuate his memory throughout the years.

JAMES A. MACLEAN,
(President, University of Manitoba)

Dr. Prowse was of the highest type of Canadian citizen, public spirited, capable, self-sacrificing, and far-sighted. Privileged to commence practice in Winnipeg thirty-three years ago, when its institutions were in the formative stage, he brought enthusiasm, good judgment and conspicuous success to their upbuilding. Wise in counsel, courageous in action, and just in decision, he was most highly regarded by all who were privileged to come in contact with him. Trained in the best schools of the Maritime Provinces and the Old Country, he brought to the performance of the daily task ideals and organizing ability of a high order and a singularly cultured mind. A pioneer in medical education, his contribution to the development of the Manitoba Medical College, in time, interest and constructive effort, was vast and beyond praise. His special interest and consideration were the young men and women who entered the medical school, by whom he was ever regarded as a guide and friend. Beloved by his intimates, admired and esteemed by his colleagues, respected and trusted by his patients, he has left a vacancy in the ranks of medicine which it will be difficult to fill. The momentum which he imparted to medical education in the west will long endure, and the spirit of fraternity and good will with which he inspired the medical profession of his

community and province will serve as a lasting monument to his name and fame. May the high ideals which he upheld, and the fine example which he furnished, long continue to encourage and sustain us in our efforts to upbuild in Canada medical institutions of the highest type and character.

"He was a man, take him all in all,
I shall not look upon his like again."

W. HARVEY SMITH

Dr. Edmond L. Aucoin, of Montreal, met death by drowning on June 19, 1931. He had been canoeing at Coteau-au-Lac and, apparently, had upset. Dr. Aucoin was 38 years old and a native of Cape Breton.

He graduated from St. Ann's College, in Nova Scotia, with the degree of Bachelor of Arts in 1911, and came to Montreal to study at the University of Montreal, where he graduated with the degree of M.D. in 1920. After serving a year as interne at the Hotel Dieu he was appointed chief interne there.

One year later Dr. Aucoin left for Paris, where he spent four years in a specialized study of ear, nose and throat ailments and returned to Philadelphia, Pa., in 1925, to receive the appointment of assistant to Dr. Chevalier Jackson at the bronchoscopic clinic in that city. He returned to Montreal last January and established a private clinic here, at the same time taking over the position of chief of the bronchoscopic clinic at Notre Dame Hospital.

Dr. William Francis Beamish, of Port Hope, Ont., died at the Toronto General Hospital on July 26, 1931. Dr. Beamish graduated from the University of Western Ontario in 1920.

Dr. Nerée Beauchemin died on June 29th at his residence in Yamachiche. Born in 1850 Dr. Beauchemin had lived the whole of his life at Yamachiche. He graduated in 1876 and immediately began practice in his native village where he made a reputation for himself as an excellent practitioner, whilst becoming one of the best of our French Canadian poets. In 1897 he published his first volume of verses entitled "Les Floraisons Matutinales" containing the poem by which he is best known "La Cloche de Louisbourg". In 1928 he published the second of his works entitled "Patrie Intime". Monseigneur Camille Roy has said of Dr. Beauchemin that no one has shown greater artistry. His lyrics are the most exquisite of those in French Canadian poetry.

Dr. Herbert William Burgess, of Toronto, died on July 15, 1931, at St. Michael's Hospital, after an illness of one week. He was in his sixty-first year. Born in Toronto, Dr. Burgess was the son of the late Samuel T. Burgess, while his mother was a sister of the late Dr. C. J. Hastings, formerly Medical Officer of Health for Toronto. The late Dr. John Burgess and the late Frederick T. Burgess, druggist, were brothers. Miss Anna Burgess of this city is a sister.

Previous to taking his course in medicine, the late Dr. Burgess was a druggist, graduating from the Ontario College of Pharmacy in 1890. He later took his degree in medicine from Trinity Medical School in 1905.

During the ensuing years he practised his profession in Toronto, and in 1913, was appointed a City Coroner by the Ontario Government.

He was active in politics, and at the time of his death was Past-President of the East York Conservative Association.

Surviving him are his widow, Amy Bell (Dot) Ferguson, who is the youngest daughter of the late Lieut.-Col. T. R. Ferguson, former M.P., Cookstown, Ont.; two sons, Frederick Herbert Winston and John Ferguson Gowan, all of Toronto.

Dr. George Cooper, aged 50, a member of the medical staff of the Ontario Hospital in London, Ont., died in St. Joseph's Hospital, London, on August 15, 1931. He was a graduate in medicine of Trinity University (M.D., 1892), and of the University of Toronto (M.B., 1906). A veteran of the world war, he had been medical officer of the second Gordon Highlanders in the Imperial army. Dr. Cooper's home was originally in Toronto, where his widow and family now reside. Prior to joining the staff of the Ontario Hospital, he practised medicine in Orillia.

Dr. William E. Deeks, of New York, recognized as one of the foremost authorities on tropical diseases, died on July 24, 1931, while sitting quietly in a chair at his home. A McGill graduate in medicine in 1893, Dr. Deeks practised for several years in Montreal, where he had a large circle of friends.

For a few years past Dr. Deeks had been medical director of the United Fruit Company and had control of forty-five hospitals in the tropics.

Born in Williamsburg, Ont., in 1866, Dr. Deeks entered the Faculty of Arts at McGill in 1885. Four years later he graduated as gold medalist and enrolled in the faculty of medicine. He was again a gold medalist in 1893 when he received his medical degree. For some years after graduation he taught zoology at McGill.

Dr. Deeks was one of the most brilliant students of his day at McGill, and a clear and forceful teacher. He was also an exceptionally able practitioner. His work on tropical diseases in the Canal Zone has brought him great prominence.

He is survived by his wife, née Clara Strinck, of Philadelphia, and one daughter Kathleen.

Dr. James Newman Fuller, one of the veteran physicians of Nova Scotia, died on July 23, 1931, after an illness of only two days. Dr. Fuller graduated at Bellevue in 1868. He was much interested in agriculture and, in his more active days, took great pride in his fine farm. He had reached the age of 85 years.

Dr. Joseph Morin, of Quebec, died in the St. Sacrament Hospital on August 3, 1931, as the result of complications following an operation last week.

Dr. Morin who was born in Baie St. Paul, had been practising in Quebec for the last fifteen years, and had established a large practice in the Ancient Capital. He was a graduate of Laval University.

Dr. William Meredith Pugh, of Kenosha, Wis., died on August 1, 1931, after a year's illness, in his sixty-ninth year. Dr. Pugh was a son of the late David and Mary Pugh, of Milverton, and was born in this village. He graduated from Toronto Medical School (1890) and after practising several years in Ontario, located in Kenosha, where he has since resided. He is survived by his widow, two sisters, Mrs. James Trow, of Stratford, and Mrs. George Roe of Milverton; and three brothers, Dr. Charles Pugh of Chicago, Mr. S. H. Pugh, of Milverton, and Mr. J. D. Pugh, of Vancouver.

Dr. M. M. Tucker, of Orono, Ont., passed peacefully away on July 20, 1931, after an illness which had lasted more than four years.

Milton Mallory Tucker was the eldest son of Joseph Lyle and Sabra Mallory Tucker. He was born in Orono, September 21, 1849, and graduated in medicine from Victoria College, University of Toronto, in 1870.

For a few years he practised his profession in Finlay City, Mich., in partnership with his cousin, Dr. George W. Jones. Upon the death of his first wife, Elva J. Scott, of Belleville, he spent about two years in study abroad in Berlin, Paris and London, becoming a Member of the Royal College of Surgeons, England. After a year in Detroit, he returned May 16, 1878, to the home of his boyhood where he continued to practise until about four years ago.

In 1880 he was appointed Coroner for the United Counties of Durham and Northumberland. He was appointed Treasurer of Clarke Township Council in 1881, succeeding his father, and retained the office for forty-six years. He was also Medical Officer of Health in Clarke for a number of years.

In 1886 he married Minnie Adeline Scott who predeceased him in 1922.

He leaves two daughters, and two sons, Dr. J. B. Tucker, of Punnichy, Sask., and Dr. M. S. Tucker, New York.

News Items

British Empire

Beri-beri in Newfoundland.—More than 600 persons on the south shore of Newfoundland have been affected by beri-beri this season. The outbreak has been attributed to an exclusive diet of white bread. It has been pointed out that the Newfoundland fishermen have a dislike for anything but the whitest of white flour. Whole wheat or brown bread they refuse to use. When the fishery fails, as it did last year on the southern coast, white bread is practically their sole fare.

The present outbreak is by no means the first appearance of the disease on the island. It was one of the complaints with which the Grenfell Hospital found considerable difficulty in coping, finally succeeding after a long campaign of instruction in dieting. Of some 1,300 persons affected last April, no less than 130 adults were partially or totally incapacitated.

In the present case the Newfoundland Board of Health, in addition to supplying food to the destitute that will help to vary the diet, has issued a bulletin dealing with the symptoms of beri-beri and urging the use of whole wheat flour and as much green food as possible.

Royal Australasian College of Surgeons. — The King has approved of the prefix "Royal" for the Australasian College of Surgeons. The college is an Australian and New Zealand organization, and its chief objects are to improve the standards of surgery and of surgical training and research. To further these objects and to assist Australasian graduates who cannot afford the time and expense involved in a visit to England for the purpose, the Royal Australasian College of Surgeons has arranged with the Royal College of Surgeons of England that the primary Fellowship examination of the latter shall be held in Australia. The first examination will begin in Melbourne on August 11th.

The aims and functions of the Australasian college are similar to those of the English college, and a close association has arisen between the two. A gratifying expression of this is the fact that the council of the Royal College of Surgeons of England is presenting a mace to the Australasian college. The president of the Royal College of Surgeons, Lord Moynihan, will visit Australia early in 1932 to present this. That Lord Moynihan will personally present the mace is naturally regarded as a special honour for the Royal Australasian College of Surgeons. The mace, which is an exact replica of one given as a mark of royal authority to the English college is being designed and executed by Omar Ramsden, of London. It will bear the arms of the English college, the arms of the Australasian college, which have recently been granted by the College of Heralds, the arms of Australia, and the arms of New Zealand. Special permission has been granted by His Majesty for the use of the orb and cross in the design of the mace.

Great Britain

Pilgrimage to the Harvey Tomb.—The final event of the Harveian celebrations this year took the form of a pilgrimage to the tomb of William Harvey at Hempstead Church in Essex, near Saffron Walden. A party of about sixty, headed by Sir Thomas Horder, Sir D'Arcy Power, Sir StClair Thomson, Dr. Herbert Spencer, and Professor Welch, journeyed by road from London on the morning of June 13th. At Hempstead Church a brief service was held, and the Bishop of Colchester gave an address. Harvey, he said, was a man of whom any age and country would have been justifiably proud. The more a good life and good work was made known, and the more a brotherhood such as the Harveian Society grew, the better for humanity. In that church lay the mortal remains of the great doctor, and a suitable monument had been erected there in honour of one whose fame was world-wide. He thanked the society for presenting to the church, in commemoration of the present occasion, a beautiful silver platen, to be used with the Elizabethan chalice belonging to the church, the original platen which went with it having been lost. The new platen bore the crest of the Harveian Society and the date of its foundation and of the gift. It was also good news to Hempstead that the Harveian Society proposed to undertake the re-conditioning and rehanging of the church bells when the tower was rebuilt, and to give a new bell to celebrate the event. The old bells, now in a bell-shed in the churchyard, were dated, one of them 1520 and the other 1575. For the rebuilding of the tower the sum of £2,700 was in hand or promised, and a further £3,000 was required. Donations were still coming in, and those responsible for the church were more indebted than they could express to the medical profession, who had shown that it was a labour of love to do all they could for the preservation of the temple which contained the Harvey shrine. Finally, said the bishop, they had assembled that day, not merely to praise famous men of old, who rested in peace and whose works followed them, but also to thank God for the work of the medical profession. Doctors of to-day went about doing good to the bodies and minds and souls of men. In every age they were among the world's best philanthropists and most sacrificing missionaries. Very few men had more opportunities of service to their kind. The healing and relief of suffering was a godlike task, and he trusted that there would never be wanting in this dear land physicians of like spirit to William Harvey, who employed heart and brain in the service of their fellow creatures and for the glory of God.

After the address Sir Thomas Horder, president of the society, accompanied by Dr. de Bec Turtle, Mr. Cecil Wakeley, and Dr. R. Cove-Smith, brought the platen to the altar, where it was dedicated by the Bishop. Subsequently the visitors inspected the Harvey Chapel and other objects of interest in the church, and even descended into the vault, where rest the coffins of various members of the Harvey family. The pilgrims were entertained to lunch in the vicarage garden, and on the return journey a halt was made at Rolls Manor, Epping Forest, where seven generations of Harveys lived, and which is now in the possession of Lady Lloyd, widow of General Sir Francis Lloyd, the Lloyds about a hundred years ago becoming related to the Harveys by marriage. In a room specially built for the purpose are shown the Harvey portraits, including William Harvey, with his father, six brothers, and sister or sister-in-law. Sir D'Arcy Power gave a brief account of the Harvey family.

Harvey, he said, was known elsewhere as an acute thinker and able administrator, but here in the home of his family he was revealed in a domestic role—for singularly strong bonds of affection united the Harvey family—and also as a connoisseur and collector of objects of art. Before the party returned to London Sir Thomas Horder expressed the thanks of everybody for the charming hospitality of Lady Lloyd.—*Brit. M. J.*, 1931, **1**: 1085.

Prof. G. E. Armstrong.—We learn from the *Dublin Herald*, of June 15th, that the honorary Fellowship of the Royal College of Surgeons in Ireland was conferred at a special meeting of the council on Colonel Sir Hugh Mallinson Rigby, Baronet, Surgeon to the King, and on Dr. George E. Armstrong, C.M.G., Emeritus Professor of Surgery in McGill University. In presenting the candidates to the President of the College, the Secretary, Sir F. Conway Dwyer, referred to the great services which Dr. Armstrong had rendered in the Great War and to his valuable contributions to surgery, and also spoke of the distinguished career of Sir Hugh Rigby. After the ceremony the new Fellows were entertained at dinner, during which the President stressed the conservatism of the College and its age, and stated that among those who have received the honorary Fellowship were Cruveilhier, Pasteur, Lister and Moynihan; the degree was to be regarded as a high honour, seldom given, and was therefore to be the more appreciated.

A.D.B.

Royal College of Surgeons of England.—An ordinary Council meeting was held on June 11th, with the President, Lord Moynihan, in the chair. Mr. G. Buckston Browne, F.R.C.S., was introduced and the President presented him with the Honorary Gold Medal of the College, together with a document declaratory of its award to him, in recognition of his valuable contributions to surgery and of his great liberality in the endowment of an Institution for Surgical Research. It will be remembered that Mr. Buckston Browne purchased Darwin's house and estate at Downe, restored and endowed them, and handed them over as a gift to the nation. Thanks to his further liberality, thirteen acres adjoining the Downe property have now been purchased, and the foundation stone of the new biological station to be built thereon and called the Buckston Browne Surgical Research Farm, was laid by the President, Lord Moynihan, on July 8th.

A Portrait of Dr. Alfred Cox.—It is intimated that Dr. Alfred Cox will retire from the position of Medical Secretary to the British Medical Association, which he has long occupied with distinction, at the centenary meeting of the Association in London next year. A group of the Association are arranging for the painting of a presentation portrait, and a general meeting of these members was held on July 18th, at Eastbourne, to elect an executive committee with the usual officers, and decide upon the organization for the collection of subscriptions.

The Osler Club.—A meeting of the Osler Club was held in London on July 12th, to celebrate the eighty-second anniversary of Sir William Osler's birthday. Dr. William Stobie, Mayor of Oxford, delivered the fourth Oslerian Oration, in which he skilfully blended the interesting narrative of Osler's inspiring leadership in the tuberculosis campaign in Oxfordshire with a moving account of Osler as clinician, chief, and friend. Dr. A. Salusbury MacNalty, of the Ministry of Health proposed, and Dr. A. P. Cawadias seconded, a vote of thanks, and Sir Percival Hartley briefly spoke in the discussion. Letters and messages had been received from absent friends: Professor J. F. Fulton, of Yale University, Dr. Henry R. Viets, of Boston, Dr. Vilhelm Maar, of Copenhagen, Sir Arthur Keith, and Professor Grey Turner. Among those present were Sir D'Arcy Power, Dr. J. D. Rolleston, Dr. K. R. Hay, Prof. D. Fraser-Harris, and Mr. Arnold M. Muirhead, whose recent *Memoir* of Lady Osler was displayed among the exhibits.—*Brit. M. J.*, July 18, 1931.

Dr. O. S. Gibbs.—Among those who have been granted Rockefeller Medical Fellowships through the Medical Research Council is Owen Stanley Gibbs, M.B., late Professor of Pharmacology at Dalhousie University, N.S. Dr. Gibbs' Fellowship is tenable in Europe.

Alberta

The Alberta Medical Association made arrangements for a post-graduate tour of the Peace River District under the auspices of the Canadian Medical Association, which began on August 12th in the town of Peace River and was continued on August 14th at Grande Prairie. Dr. A. E. Archer F.R.C.S. (Can.), of Lamont, and Dr. D. D. Leitch, Professor of Pædiatrics at the University of Alberta gave lectures at these places.

A public meeting will be held at Berwyn in connection with the Women's Institute. The iniquities of certain contracts are more manifest on account of the general economic conditions prevailing in the country than would be if times were better. Some mine contracts have inserted a clause that in case a miner is killed at his regular employment all the privileges of the medical contract shall extend to the widow and family and other dependents as long as they remain in the camp and shall be so rendered without fee or charge, notwithstanding that the widow and family may be receiving pensions from the Compensation Board. Another clause inserted is that if any miner during any two-week period does not work for three full days, all medical services shall be given free regardless as to whether the next and for many continuous two-week periods the miner may have steady employment. Certain rural contracts carry a flat salary with no mileage or calls, with the result that one-third of the calls are unnecessary. It has been suggested that the Council of the College of Physicians and Surgeons of Alberta should take unto itself the power or seek it from the Legislature, to decide on all contracts before acceptance by any member of the profession. The Council is not prepared to go that far, but is willing to furnish a representative to attend the discussions to see that all parties to the contract are properly protected.

The Alberta Municipal Acts require amendments to the extent that there will, automatically, be someone responsible to give instructions for the provision, care and treatment, of the resident indigents. While the burden is placed on the local Municipal Council their failure to assume the responsibility in many cases leaves the needy "au large," as the French express it. It is necessary for the indigent to take the question of liability to court, which is not done by the party asking relief, though a resident. It is felt that if a clause were provided that where the local council failed to act, the government could act, the problem would be solved.

The chief Coroner of the Province has issued instructions to all coroners in Alberta, to the effect that in all inquests where it appears that the circumstances surrounding the death of the deceased may be the subject of civil action, and more especially where railway companies, mining companies or other corporate bodies are interested, inquests shall be adjourned for at least twenty-four hours after the jury

has viewed the body, in order that parties interested may be represented by counsel if they so desire.

The Provincial Department of Health is paying local physicians who assist when the travelling clinic is in their district twenty dollars a day, instead of fifteen dollars as formerly.

The Provincial Department of Health has offered to furnish each municipality all serums for free treatment at half price. Many have not accepted the offer. This subject will be brought to their attention this fall at the annual meeting of Alberta Municipalities. At present all serums for prophylactic purposes are supplied free by the Department of Health.

An amendment to the Medical Act forbids any physician from holding himself out as a specialist or advertising himself as such unless and until he has received a specialist's certificate from the University of Alberta. The question has naturally arisen, would a physician who restricted his practice to any branch of the healing art and so advised the public through a card in the press or by such notice on his office door be thus violating the Act, unless he has a certificate from the university? This matter has been clarified by the university on the advice of a competent legal authority as follows: "A specialist in the practice of the regular medical profession is one who has made a special study of a group of diseases for such time and in such manner as defined by the Senate of the University, and who holds a certificate and is actively engaged in the practice of his specialty. Anyone who holds himself out to the public in the Province of Alberta as limiting his practice to any group of diseases is to be regarded as holding himself out to the public as a specialist, and is not qualified for the practice of that specialty until such person has received the diploma of the Senate of the University. Any representation which directly or indirectly conveys to the public the impression that a practitioner is so qualified, unless he holds the certificate of the Senate of the University of Alberta, should be regarded as an infringement of the Medical Act".

Should hospitals be graded in such a way that the Department of Health could take the position that, regardless of the qualifications of the operating surgeon, certain hospitals should be limited in their scope of operations? The Council of the College of Physicains and Surgeons is of the opinion that a most thorough system of hospital inspection should be inaugurated by a medical practitioner and not by a nurse, and that no definite action should be taken until such inspection has been completed, compiled and properly considered. In order to induce a greater number of pregnant women to make use of hospital facilities for maternity patients many Alberta hospitals are making a flat rate for a twelve days' stay in hospital, including case room, drugs and dressings, and are finding this very satisfactory and in the interest of the patients.

A good attendance is expected at the annual meeting of the Alberta Medical Association which will be held in Calgary on September 16, 17th and 18th. Among the speakers from outside the province will be Drs. A. Primrose, T. C. Routley and Harvey Agnew, Toronto, Drs. C. F. Covernton, G. F. Strong and A. S. Monro; Vancouver; Dr. G. S. Cameron, Peterborough.

During the first five months of the present year the revenue from the Calgary municipal hospitals fell about $9,000.00 under the estimated $75,000.00 upon which the hospitals budget was based. The city was able, however, to reduce by $7,000.00 the estimated expenditures, making the total charge to the mil-rate for the first five months of this year to $52,323.66.

From January 1st to May 30th revenues from the hospitals amounted to $66,220.21, compared with $78,364.10 during the same period of 1930. The total expenditures to the end of May of this year was $118,543.87, compared with $130,896.46 in the same period of last year. The charge to the mil-rate to May 30, 1930 was $52,532.36. Though the city has been able to save about $7,000.00 on its estimated expenditures it is impossible to say how long it will be possible to keep them reduced. The city budgeted for a bigger deficit from hospitals this year than last. Last year the charge to the mil-rate was about $114,000.00, while this year $125,000.0 was estimated. During the month of May hospital collections amounted to $13,380.00, compared with $15,868.00 in May, 1930, a decrease of $2,488.00. Expenditures were reduced $2,918.94 from the $25,951.88 expended in the same month last year.

G. E. LEARMONTH

British Columbia

In the July number it was stated that the Vancouver Schools Medical Officer had adopted a modification of the quarantine rules in dealing with measles. This was an unfortunate error. The procedure described applies to rubella or "German" measles, and not to ordinary measles.

Hon. S. L. Howe, Provincial Secretary, has announced that a commission will shortly be appointed to inquire into the matter of irregular practitioners of all descriptions, and to recommend suitable measures to safeguard the public health from quacks. Press reports indicate that Mr. Justice Murphy is to be placed in charge of the enquiry.

Dr. D. E. Robertson, of the Sick Children's Hospital, Toronto, addressed a gathering of medical men in Vancouver on July 14th, on "The surgery of the sympathetic nervous system." Three days later, on July 17th, Dr. Primrose, Dean of Medicine in the University of Toronto spoke on the value of records, particularly in relation to cancer.

C. H. BASTIN

Manitoba

On August 1st, Mrs. Margaret Scott, the foundress of the Margaret Scott Nursing Mission, and called by many on account of her good works "Saint Margaret", died in the Winnipeg General Hospital. Of United Empire Loyalist stock, a daughter of Judge Boucher, of Peterborough, she married William Hepburne Scott, Q.C., who was active in both federal and provincial politics and was a member of the Ontario Legislature at his death in 1881.

Left a widow at the age of twenty-five, and dependent on her own resources, she obtained a position in the Midland Railway office at Peterborough and later was transferred to Montreal. In 1886, through the kindness of Mr. H. H. Smith, father of Dr. Harvey Smith, and at that time Dominion Land Commissioner at Winnipeg, she secured a position in his office. Later she transferred to a law office. About this time she became interested in relief work and gave much assistance in that connection to Rev. C. C. Owen, of Holy Trinity Church. Finally, she gave up her position and, without any remuneration except that given by those interested, entered upon a life of service. She visited the police court almost daily seeking out the wayward and unfortunate who were in need of help. No appeal was made by or for her for money, no publicity was sought, and no entertainments held in the interests of her work. Her self-denying work, however, was known to many influential Winnipeg people. Untrained as a nurse, she found in her daily rounds much need for nursing care,

and by study and application, she strove to fit herself for a nurse's duties. As the work developed it was clear that no one individual could carry it on and with the assistance of friends, particularly Mr. Ernest Taylor, a bank manager, the Margaret Scott Nursing Mission was formed in 1904 to provide nursing care for the poor. The Winnipeg General Hospital cooperated by sending nurses in training to the Mission to receive practical instruction in the homes of the poor. The present home of the Mission is at 99 George Street, and the considerable extent of the work of the Mission at the present day is indicated by the fact that in 1929 the total number of cases treated was 2,812. There are now four graduate nurses in the service and eight student nurses, each taking two months' training. Other phases of relief work carried on by Mrs. Scott were the opening of a wood yard to provide work for unemployed men and a child hygiene department, which latter work was subsequently taken over by the School Board.

In the various good works originated or undertaken by her, and particularly in the Nursing Mission which bears her name, Margaret Scott might have said and truly, though she would have been the last person to boast, that she had raised a monument more enduring than brass.

It is announced that Dr. A. T. Mathers has been appointed Dean of the Medical Faculty of the University of Manitoba, replacing the late Dr. S. W. Prowse.

R. G. Inkster, F.R.C.S. (Ed.), Demonstrator of Anatomy in Leeds University, has accepted the position of Professor of Anatomy in the Faculty of Medicine, University of Manitoba, and it is announced that he will take up his new duties in September.

The Sisters of St. Boniface Hospital have recently issued an attractive booklet in which Dr. J. C. Hossack, Medical Director, tells the story of the hospital from the coming of the first four Grey Nuns in 1844 and the building of the first hospital in 1871 down to the present day. Other contributors are Dr. J. D. Adamson, Dr. Jas. Prendergast and O. G. Hague.

Steps are being taken to bring about a closer rapprochement between the College of Physicians and Surgeons of Manitoba and the Manitoba Medical Association.

Dr. A. M. Goodwin has been appointed Registrar of the Tumour Clinic at the Winnipeg General Hospital.

ROSS MITCHELL

New Brunswick

Some time ago, it was reported to the Attorney-General's Department that the body of a still-born infant had been discovered on the property of Dr. M. L. Jewett of Millville. The Attorney-General, Hon. C. D. Richards, ordered an investigation which resulted in an inquest. In the meantime, the body had disappeared and by the direction of the Attorney-General, the inquest was proceeded with in accordance with Section 23 and 24 of the Coroner's Act over a body which the authorities could not produce. It was stated that the inquest was held in the public interest. After a most searching inquiry under the direction of Dr. Chas. MacKay, of Fredericton, who was directed in this capacity by the Attorney-General, as Dr. Jewett, himself, was the Coroner in the neighbourhood, it was established that the infant in question was an encephalic monster which had never lived. The body of this monstrosity had for a time been preserved in Dr. Jewett's office. Due to some error in technique, decomposition set in and on the doctor's instructions, the specimen was thrown into a pile of debris where later, it was reported to have been found. The investigation cleared up a series of gruesome fabrications that were being circulated in the neighbourhood. On the conclusion of the inquest, Dr. Jewett received an ovation from his friends and neighbours. The incident was unpleasant to all concerned, but was handled in the only possible satisfactory way.

Dr. Arthur L. Donovan has recently been appointed to the medical department of the out-patient service in the Saint John General Hospital.

A. STANLEY KIRKLAND

Nova Scotia

The annual refresher course arranged by the Faculty of Medicine of Dalhousie University is to begin on September 7th, and continue for five days. The program will be quite as interesting and practical as in previous years, and the course remains open to all qualified physicians.

Summer visitors to Halifax included Drs. H. G. Grant and C. F. Moriarty, who hold important positions with the State Health Departments of Virginia and Maryland respectively, and Dr. H. S. Morton (son of Dr. C. S. Morton, Halifax), who is pursuing graduate work in London and intends sitting for the final examinations for the Fellowship of the Royal College of Surgeons of England next year.

The Nova Scotia Dental Association met in annual session at Kentville early in July, Dr. Murray Logan, of Halifax, presiding. Drs. Vaughan and Wasgatt, of the Harvard School of Dentistry, were among those contributing to the program, and they also conducted clinics. Dr. H. O. Harding, of Yarmouth, was elected to the presidency, and Dr. J. Stanley Bagnall, of Halifax, was re-elected secretary.

Dr. R. A. Moreash, of Halifax, a recent graduate of Dalhousie, has been awarded a grant for a year's research by the Banting Research Foundation. He will work under Dr. Dreyer, at Dalhousie, investigating the effects of various organic arsenicals and bismuth compounds, particularly on the liver, in the endeavour to determine why these preparations sometimes cause damage and how this may be prevented and remedied.

Dr. C. St. Clair Guild (Dal. 1925) has recently been awarded the doctorate in public health of Yale University, and Dr. E. L. McQuade (Dal. 1927) has received the same degree from Johns Hopkins University. Dr. Guild is associated with the American Public Health Association, but is at present "on loan" to the Committee on the Costs of Medical Care. Dr. McQuade has been appointed Associate Professor of Hygiene and Public Health at the University of Virginia.

The Association of Medical Health Officers met at Truro on July 7th, under the presidency of Dr. W. F. MacKinnon, of Antigonish. The Minister of Health, Hon. Dr. G. H. Murphy, outlined the plans for dealing with tuberculosis, which met with general approval. Among others who addressed the meetings were Drs. A. F. Miller, of Kentville, and W. B. Hendry, of Toronto. Dr. Miller dealt with tuberculosis control, while Dr. Hendry spoke on maternal mortality. Dr. T. R. Johnson, of Great Village, was elected president for the ensuing year. Dr. T. I. Byrne continues as secretary.

On the afternoon of July 29th, a class of nurses graduated at the Nova Scotia Hospital with appropriate ceremonies. Rather unusual interest attached to the

ceremony, as it was the first occasion in which the Minister of Public Works did not preside. Formerly the hospitals maintained by the government of Nova Scotia were associated with the Department of Public Works, but upon the creation of a Ministry of Health the hospital was placed under this ministry, and later the general administration was entrusted to a commission. At the recent exercises, Mr. John S. Misener, vice-chairman of the Board of Commissioners, presided, and Mr. William R. Powell, another commissioner, presented the diplomas and prizes. Hon. Dr. Murphy, Minister of Health, gave an interesting presentation of the new order of things, and complimented Dr. Lawlor on his efficient superintendence of the large institution of which he is in immediate charge. Dr. W. H. Hattie addressed the graduates. After the ceremony the guests inspected the hospital and then repaired to the lawn where refreshments were served.

To serve a further term of three years the Government has reappointed the following to the Provincial Medical Board:— Dr. B. E. Goodwin, Amherst; Dr. Alister Calder, Glace Bay; Dr. W. N. Cochran, Mahone; Dr. O. B. Keddy, Windsor; Dr. B. A. LeBlanc, Arichat; Dr. F. R. Little, Halifax; Dr. John Rankine, Halifax.

It is announced that Dr. J. J. MacRitchie, of Goldboro, N.S. has been appointed divisional medical health officer for the western portion of the Province. Dr MacRitchie was born in Englishtown, N.S. in 1885. Following three years in the B.Sc. course at Dalhousie he studied medicine and graduated from Dalhousie University in 1911. He assumed his new duties June 1, 1931. W. H. HATTIE

Ontario

The Chairman of the Ontario Cancer Commission returned from Europe in August. Further sessions of the Commission will be held in September. Various research and treatment centres were visited in England, France, Belgium, Germany, Sweden and Denmark. The Commission hopes to report in the autumn or early winter.

Hon. Dr. S. M. Robb, Minister of Health has announced the establishment of a centre for clinical and laboratory psychiatric research and post-graduate training for physicians and nurses. Junior physicians entering the Ontario Hospital Service will undertake three years of post-graduate study in mental hygiene and in diagnosis and treatment of mental disease. Use will be made of the Toronto Psychiatric Hospital which is in close relation to the University of Toronto and the Banting Institute. It cares for about 800 in-patients and the same number of out-patients each year.

Dr. C. B. Farrar, Professor of Psychiatry in the University of Toronto, has been appointed Editor-in-chief of the *American Journal of Psychiatry*. The *Journal* has completed eighty-eight years, with only seven occupants of the editorial chair.

Up to August 13th there were 6 cases of cerebro-spinal meningitis in Toronto of which 4 died. All were contracted outside the city, either in New York State or in contact with New York cases.

At the recent examinations of the Medical Council of Canada, 90.3 per cent of the students of the University of Western Ontario were successful. The average for all Canada was 87 per cent.

Dr. Julian Loudon, Chief Surgeon of St. Michael's Hospital, has been appointed Associate Coroner for Toronto, taking the place of the late Dr. J. M. Casserly.

Dr. Duncan Arnold Morrison, of Brantford, has been appointed a Coroner for the County of Brant.

At a recent meeting of the Academy of Medicine, London, the following officers were elected for the ensuing year: *President*, Dr. H. O. Foucar; *Vice-President*, Dr. D. D. Ferguson; *Secretary*, Dr. A. J. Read; *Treasurer*, Dr. J. H. Geddes; Dr. G. C. Hale.

Among the pioneers of the medical profession in Ontario, we find Dr. Malcolm Stalker of Walkerton. Dr. Stalker graduated from Trinity College and the University of Toronto in 1878. He commenced practice at Newcastle, in Durham County, but, later on, went to Walkerton where he still resides. Dr. Stalker is now entering upon his fifty-fourth year of practice. He has served as Medical Officer of Health of the Town of Walkerton for the last ten years. In addition to medical work, Dr. Stalker has taken an active part in municipal affears. In 1893 he was elected reeve and later mayor of the Town, serving for two terms. J. H. ELLIOTT

At the July meeting of the Middlesex County Medical Society held at the country home of Drs. W. J. and H. A. Stevenson, the following were elected as Honorary Members of the Society: Drs. Thos. D. Orme, of Lucan; W. J. Stevenson, H. A. Stevenson, of London; J. R. McCabe, of Strathroy, father of the late Dr. Allan McCabe; A. S. Thompson, of Strathroy, brother of Dr. Septimus Thompson; and Dr. A. McLean, of Detroit. Dr. W. T. Banting was elected Historian and will collect data concerning the pioneer doctors in Middlesex.

Quebec

The construction of an addition to the hospital at St. Johns, Que., in the shape of two new wings, is to start shortly. The alteration will triple the capacity of the institution, which at the present time has 100 beds. It will cost about $300,000.

The wings will be five storeys in height, one, 180 by 40 feet, the other 134 by 45 feet. An old wing is to be demolished when the new ones are completed. The provincial government contributed $200,000 toward the expense of the addition, and the parish of St. Johns $50,000. The Grey Nuns, who operate the hospital, will be responsible for the remainder.

United States

The International Assembly of the Inter-State Post-Graduate Medical Association of North America will be held at Milwaukee, October 19th to 23rd. The program is a very full one and the names of the contributors are such that the presentations made are certain to be of the very highest order.

Numerous diagnostic clinics will be held and addresses and papers will be given on matters relating to the thyroid gland; the circulatory system; the gastro-intestinal tract; oto-laryngology; malignant diseases; urology; the central nervous system; the respiratory system; fractures; the breast; the gall-bladder and liver; to mention only some of the general topics.

Among the Canadians taking part we notice the names of Alan Brown, F. N. G. Starr, R. D. Rudolf, Toronto; Campbell Howard and E. M. Eberts, Montreal.

The President is Dr. Henry A. Christian, Boston,

and the Executive Secretary, Dr. Edwin Henes, Jr., Milwaukee.

This meeting promises to be of exceptional interest.

University of Pennsylvania School of Medicine.—The Rockefeller Foundation has announced a grant of $75,000 to the school for the extension of the method of studying the microscopic details of the growth of tissues in warm-blooded animals.

The erection of a Cancer hospital is provided for by the will of Mrs. Mary B. C. Crothers Dulles. The estate amounting to $300,000 was left to an only daughter for her life time, after which the amount remaining is to go to the Trustees of the University for the purpose of erecting a building for the treatment of cancer.

New York University.—It is planned to start a campaign to raise $14,000,000 for the purpose of developing another medical centre on the East River. Of this amount $5,250,000 is allocated for the erection and maintenance of the College of Medicine building. The plan calls for ten buildings, some of which are already erected and need only to be enlarged and modernized.

General

Vienna requires the Bachelor's Degree.—The dean of the Medical Faculty of the University of Vienna has notified the American ministry at Vienna that American citizens who file applications to become regular students in the medical department must have the degree of Bachelor of Science or Bachelor of Arts. In addition, prospective students must comply with the minimum American requirement: that is, twelve hours of chemistry, eight hours of biology, and eight hours of physics. They must also take in Vienna a part of the examination in anatomy, histology, and physiology.—*The Diplomate*, June, 1931, **3**: 21.

Post-Graduate Courses at Vienna.—The Faculty of Medicine of the University of Vienna announces the Forty-Second International Post-Graduate Course, which will take place from September 28th to October 10th. Special attention will be given to treatment and the newer advances in medicine. After this course is completed group-instruction will be provided for those who wish this. The charge for the full course is S. 50. Full information can be obtained from Dr. A. Kronfeld, Porzellangasse 22, Wien, IX, Austria.

Ramon y Cajal.—A statue of the celebrated histologist Professor Ramon y Cajal was recently unveiled in the courtyard of the Madrid Faculty of Medicine.

Hastings Memorial Fellowship.—The University of Toronto has established this Fellowship to commemorate the life and work of the late Dr. C. J. O. Hastings, for many years health officer of Toronto. The Fellowship was made possible by funds raised by public subscription organized by the Canadian Association of Hygiene Council and will be awarded every three years. The first award will be made in October, 1932, with a value of $1,500. The Fellow will engage in original research in the field of preventive medicine under the direction of the head of the Department of Hygiene and Preventive Medicine.

International Medical Post-graduate Courses in Berlin.—These are arranged with the help of the medical faculty of the University by the Lecturers' Association for medical continuation courses and the Kaiserin Friedrich-Haus. The following are announced for the autumn of 1931.

(1) Internal medicine with special regard to the clinic, October 5 to 17. Fee, Reichsmarks 75. (2) Children's disease, October 5 to 17. Fee Reichsmarks 100. (3) Urology, October 15 to 21. Fee, Reichsmarks 100. (4) Medical psychology and psychotherapeutics, October 26 to 31. Fee, Reichmarks 50. (5) Interthoracic surgery, with special regard to tuberculosis of the lungs, October 26 to 30. Fee, Reichsmarks 80. (6) Physical and dietetic treatment, October 26 to November 11. Fee, Reichsmarks 75. (7) Special courses on all special fields of medical science, including practical work, monthly.

For the spring of 1932 the following courses are planned: X-ray; obstetrical-gynæcological post-graduate week; a post-graduate course for surgeons; a post-graduate course on internal medicine; diseases peculiar to industrial workers, with special regard to medical supervisors' activities; a post-graduate course for oculists (possibly).

The information bureau of the Kaiserin Friedrich-Haus, Berlin NW 6, Luisenplatz 2-4, will give information on all questions relating to the above.

Post-graduate Courses at Locarno.—The third of the international medical post-graduate courses arranged by the Tomarkin Foundation of New York will be held at Locarno, from October 11 to 26, 1931. Further particulars may be obtained from the secretary of the Tomarkin Foundation, Locarno, Switzerland (Box 128).

Book Reviews

Nutrition and Diet in Health and Disease. James S. McLester, M.D., Professor of Medicine at the University of Alabama. Second edition. 891 pages. Price $9.00. Philadelphia and London, W. B. Saunders Co.; Toronto, McAinsh & Co., 1931.

This book is what it purports to be, a work on dietetics. It stands out in relief against the many books on diet which in reality are collections of prescriptions, giving diets for this disease and that. The author recognizes an important fact, namely, that our knowledge of dietetics is still in a condition of flux. As he well puts it, many discoveries which appear to-day to represent a real advance may prove to-morrow to be of little or no value. Judging, however, from the list of references, the author appears to have chosen wisely from the variety of material available. Fortunately, he has had a wide clinical experience; this has protected him against over-enthusiasm. His diets are based upon the happy combination of experiment and common sense. Perhaps the best example of this combination is found in the chapter on the "protein problem". The author asks, Shall we accept as correct that amount of food (protein) which the race has instinctively chosen, or shall we adopt the figure indicated by experimental studies? He wisely concludes that to enjoy sustained vigour, and to experience his normal expectancy, man must eat that quantity of protein which the race in its long experience has widely chosen, namely, about 100 grams. Other examples of the combination of experiment and common sense are found in the reference to the "satiety value" in the discussion of "the place of sugar in the diet" and in the use of diets in diseases of the skin.

The most valuable contributions are found in those sections of the book which deal with fundamentals in the evaluation of diets. From this point of view the book is as much a work on physiology as on dietetics. With the use of this fundamental knowledge, the physician need not follow a prescribed diet for a given disease blindly; he can intelligently select for himself the proper form of treatment.

In the section on diabetes, it is pleasing to note that under-nutrition is still stressed as an important factor in the treatment of this disease. "The metabolism must be kept low and with this end the patient should be permitted only such an amount of food as is necessary to meet his minimal metabolic requirements and to prevent his drawing on his body tissues" and, the author points out a fact not generally recognized that the curtailment of food will reduce the metabolic rate, which reduction will in turn make it possible to maintain nutritive equilibrium on a materially lessened intake.

The book contains, in addition, a large number of very useful tables and charts. Amongst them, one finds the well-known "Chemical composition of American food materials". As is well-known, diets, particularly with regard to their carbohydrate contents, are largely constructed from the values given in this table. One, therefore, misses the more recent analyses of Lawrence and McCance. These differentiate utilizable from non-utilizable carbohydrates and, because of this, diets can be made much more attractive, at least with respect to their carbohydrate contents.

The book is clearly written and should constitute an indispensable addition to the library of the busy practitioner.

Breast-Feeding. Margaret Emslie, M.B., Ch.B., Late Senior Assistant Medical Officer for Maternity and Child Welfare, County Borough of Croydon. 142 pages, illustrated. Price $1.50. London, Oxford University Press; Toronto, McAinsh & Co., 1931.

Dr. Emslie's book is timely. As she says in the preface, "At present many babies are weaned in the first week of life; in some cases natural feeding is apparently not attempted at all, and many mothers who do nurse their babies require help and instruction, especially if the nursing is to be continued for eight or nine months." The value and importance of breast-feeding are not properly understood and a book which sets them forth clearly is a boon to the profession. The chapters on "The establishment of breast-feeding" and "The management of breast-feeding" are perhaps the best in the book and the chapter on "Weaning", like all the others, is practical and useful to a degree not often found in text-books. This book appears, indeed, to be the first book published which deals with breast-feeding alone. The whole is carefully written and shows evidence of wide and thorough reading. It contains most of the information available about lactation and is sure of a welcome from the profession. Nurses will find it of great value in their work. Nursing by the mother is not by any means the universal practice in Canada. It ought to be. As Dr. Emslie says:—

"Breast-feeding is a function that depends in the first place on good health: the general health of the community has improved incontestably with better habits of dieting and hygiene and a raised standard of living since the war. In this women have improved beyond the average. There is every reason to suppose that with a little due concentration and the necessary statement of relevant facts breast-feeding should be easier and more certain than ever before."

Manual for Diabetics. Gladys L. Boyd, M.D., Director of Diabetic Clinic and Clinical Assistant, Hospital for Sick Children, Toronto, etc., and Marion D. Stalsmith, Dietitian to Diabetic Clinic, Hospital for Sick Children, etc. Third edition. 90 pages. Price $1.50. Funk & Wagnalls Co., New York and London, 1931.

In this new edition the authors have not found it necessary to alter any essential details. They have however added four pages of new tables of food values and diabetic cooking, which are of great convenience. It is always well to have as many variations of menu as is possible. We can only repeat our former unhesitating recommendation of this manual for both practitioner and patient.

Surgery, its Principles and Practice for Students and Practitioners. Astley Paston Cooper Ashhurst, A.B., M.D., F.A.C.S., Professor of Clinical Surgery in University of Pennsylvania, etc. Fourth edi-edition. 1189 pages, illustrated. Price $10.00; Lea & Febiger, Philadelphia, 1931.

In these days of much printing, when text-books after the first edition sometimes appear in two or three volumes and systems become swollen to the size of encyclopedias, it is a pleasure to find an author keep his text book a reasonable size.

This fourth edition of Ashhurst's Surgery covers the whole field of surgery in one moderate sized volume and does it in a comprehensive manner. The illustrations have the freshness of being a little unusual and are taken from the author's personal contact with patients, which adds interest to the text. The new matter introduced, and the sections rewritten, make the volume an exceedingly safe book of reference for the use of either student or general practitioner.

Histopathology of Skin Diseases. Lee McCarthy, M.D., Associate Clinical Professor of Dermatology, Georgetown University Medical School, etc. 513 pages, illustrated. Price $27.50. St. Louis, C. V. Mosby Co.; Toronto, McAinsh & Co., 1931.

This is an extremely elaborate work on the anatomical effects of disease on the skin. It really reflects the modern views as most generally accepted, since Dr. McCarthy has collected his material from a great many sources. In this way the authority of the book is unquestionable.

The work depends on its illustrations almost altogether, and it may be said at once that these are as nearly perfect as is possible. None but the very clearest microphotographs have been used, and their reproduction is extraordinarily good. Colour is generally used, but often the plain microphotographs are so sharp and well selected that colour would add very little to them. The cost of the book will not recommend it to anyone except those who are interested in diseases of the skin, but to these persons it should be of great value.

Text-Book of Physical Therapy. William Benham Snow, M.D., 708 pages, illustrated. Price $10.00. Scientific Authors Publishing Co., 585 West End Ave., New York, 1931.

An elaborate consideration of electricity in its various forms as applied to Medicine and Surgery.

While the book bears witness to the many years experience of the author, it is probable that very few physiotherapists and still fewer physicians and surgeons will be found to share his enthusiasm for such a widespread use of electricity in general and static electricity in particular.

Physiology. Clio Medica No. 5. John F. Fulton, M.D., Sterling Professor of Physiology, Yale University. 141 pages, illustrated. Price $1.50. Paul B. Hoeber, Inc., N.Y., 1931.

This volume, one of a series of primers on the history of medicine, is a very brief history of the development of the science of physiology from Aristotle and Galen to the present day. There are chapters on circulation of the blood, digestion, and respiration. The nerve and muscle branches of physiology are, unfortunately, not considered. There is an interesting but brief chapter on the development of physiology and teaching

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laboratories during the nineteenth century. The consideration of present day physiology is limited practically to the raising of the question of the status of "General Physiology."

Diagnostic Methods and Interpretations in Internal Medicine. Samuel A. Loewenberg, M.D., F.A.C.P., Associate Professor of Medicine, Jefferson Medical College, etc. Second edition. 1032 pages, illustrated. Price $10.00. Philadelphia, F. A. Davis Co., 1931.

This work, appearing only two years ago, is already in its second edition, with numerous additions and some changes necessitated by advances in the clinical study of disease. The author guides the student and practising physician along the well developed paths of bedside clinical diagnosis—inspection, palpation, percussion and auscultation and study of function and functional changes.

Laboratory study forms a background in certain types of disease, and technique is described for simple laboratory procedures which may be carried out in the office. The procedures which may be carried out only in well equipped laboratories are described and a chapter is devoted to the interpretation of laboratory results and reports.

In a work which is so comprehensive some deficiencies yet may be expected. For example, in the section on bronchiectasis there is no reference to the value of radiology, nor does the radiologist in his chapter refer to the use of lipiodol and x-ray in diagnosis of this disease. There is no mention of the value of x-ray in the section on diagnosis of early tuberculosis. In the diagnosis of uræmia convulsions are mentioned, but not the recurring convulsions or series of fits alternating with coma and stupor. There are some evidences of careless writing, as when we read that crepitant râles "are caused by separation of the vesicles after having been glued together". We believe the walls of a vesicle separate, but not the vesicles.

Illustrations are fully used to make clear methods or conditions described in the text. Why waste space with Fig. 1? The figures illustrating skin rashes are generally poor and many of them might well be omitted or replaced by others which would really picture the condition. These are only kindly comments on some shortcomings in a most excellent volume which we can highly recommend as a first-class work on diagnosis.

Bedside Interpretation of Laboratory Findings. Michael G. Wohl, M.D., Associate Professor of Experimental Medicine. Temple University Medical School, Philadelphia. 321 pages, illustrated. Price $6.00. St. Louis: C. V. Mosby Co.; Toronto: McAinsh & Co., 1931.

In his preface the author explains that the purpose of his book is to deal with the middle ground between the fields of activity of the clinical pathologist and of the general practitioner. The latter is no longer able to keep up with all the modern developments in the field of laboratory diagnosis. He aims to aid the physician in selecting the proper tests useful in diagnosis, and to aid him in the interpretation of the laboratory reports supplied him. He has given us a good practical guide for this purpose. The work is well condensed, yet covers a wide field—sputum, gastric and duodenal contents, fæces, blood, blood groupings, acidosis, the urine, cerebrospinal fluid, transudates and exudates, with chapters on skin and immunological reactions, serodiagnosis of pregnancy, etc. The figures and photographs are numerous, well chosen and illustrative.

There are some mistakes in the names of authors quoted, for example, Hollman for Holman, Doshez for Dochez, Bella for Bela Schick, and once media is used as a singular noun. Perhaps as a result of the attempt to condense, some statements are not accurate, as when he says the sputum of bronchiectasis is profuse and fetid. It may be, but is not always so.

There is a very creditable attempt to include only those procedures which are tried and reliable, yet we think the author quotes unduly strong statements in relation to the claims made for the efficacy of serums in pneumonia. In the aim to correlate the laboratory and the clinic and to place a proper value upon laboratory reports as applied at the bedside, the fact is well brought out that a laboratory report is only an adjunct to diagnosis and not the diagnosis itself.

Hay Fever, Hay Asthma. Its Causes, Diagnosis and Treatment. William Lloyd, F.R.C.S., late Surgeon-in-Chief of the Nose, Ear and Throat Department, Kensington General Hospital. Third edition, 124 pages. London: Straker Brothers Ltd., 1931.

The earlier editions of this work appeared in 1902-3, one of which received favourable review in this *Journal*, or, rather, in its predecessor, the *Montreal Medical Journal*. Medical science has made immense advances since then in its study of the etiology of hay fever and hay asthma. This book is based upon British experience and deals almost entirely with the disease as caused by the pollens of grasses. Only passing and very unsatisfactory reference is made to the autumnal hay fever which is our most common type here. Nor has there been any serious attempt to make use of the enormous recent literature of North America upon the relation of the pollens to the spring and autumnal types of hay fever. The writer does not appear to be aware of the striking results which have followed the attempts made here to desensitize patients to the pollen to which they are found susceptible.

Writing as a rhinologist the author points out the almost constant finding of hypersensitive areas in the mucous membrane of the nasal passages of hay-fever patients. He discusses numerous prophylactic and palliative measures, but concludes that the most desirable mode of dealing with a patient who suffers from hay fever is to rid him of the susceptibility. This he believes should be approached through treatment (destruction) of the sensitive areas in the nasal mucous membrane. Case reports occupy 26 pages. The author believes that 80 per cent of cases of hay fever and asthma can be cured by his method of cauterization, which he fully describes.

Operative Surgery. Martin Kirschner, Professor of Surgery and Director of the Surgical Clinic at the University of Tubingen (Germany). Authorized translation by I. S. Ravdin, B.S., M.D., J. William White, Professor of Research Surgery, University of Pennsylvania. 666 pages, illustrated. Price $13.00. Philadelphia, London and Montreal: J. B. Lippincott, 1931.

This work is a translation and one's first thought is whether the translator has succeeded in setting the mirror up so that the author's whole effort should come through. The clarity of the English text soon dispels all doubt in this respect and makes one wonder if Dr. Ravdin has not succeeded in accomplishing what Fitzgerald is said to have done in his translation of Omar Khayyam, namely improving upon the original.

The book does not claim to cover the whole surgical field. The principles enunciated, however, and the sound surgical philosophy which underlie the whole structure of our art and science give one, in the early pages, a sense of security which is well sustained as the surgical processes are evolved and detailed. The operation itself the author speaks of as the "most dramatic part of surgical therapeusis"; but nevertheless, only a part. Some excellent advice is given on the place of the operation in surgery. The surgeon that would live by the deftness of his fingers and his facility for invading territory, where more fearful angels are not found, has

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All inquiries and communications should be addressed to:

The Registrar-Secretary
Royal College of Physicians and Surgeons of Canada
184 College Street, Toronto 2.

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80 ADDRESSES

much to read and study in the counsel given regarding the appraisal of the whole patient to stand the necessary strain of the operation. Contraindications to operative procedure are well portrayed; preoperative and post-operative methods find a prominent place and are described in the fullest detail. While conservatism is the watchword there must be no hesitation to operate when the operation alone offers the only chance and even when that is but a small chance.

While it is not easy to particularize, the portion of the book, one-sixth of it, dealing with bone and joint surgery, has a special appeal. Despite all that has been written and spoken on this subject the author easily evolves new thoughts and describes new methods of treatment which give the character of a goodly element of originality to the whole text. Other methods than his own are described. Some are adopted with special modifications which the author claims as improvements. One may not always agree, but he must always acknowledge the evidence on every hand of profound surgical knowledge and wide experience. Reference should be made to the operations on bloodvessels, nerves and tendons, to the control of pain, and to the various forms of anæsthesia. The whole text is carefully illustrated. It contains over 600 pages and the matter is well arranged. This book should easily hold its place among the best of our silent friends in surgery.

Primary Syphilis in the Female. Thomas Anwyl Davies, M.D., Director of the Whitechapel Clinic, late S.M.O. of the Venereal Department at St. Thomas's Hospital, London. 111 pages, illustrated. Price $3.75. London: The Oxford University Press, 1931; Canadian Agents: McAinsh & Co. Ltd., Toronto.

This small treatise deals mainly with the author's observations on early luetic manifestations in the female as seen at the venereal departments of St. Thomas Hospital, London. In a series of 584 primary genital chancres 257 or 44 per cent were located on the cervix. This is a much higher incidence than is reported by other observers and is attributed by the author to careful and more frequent examinations of the cervix in all suspicious cases and contacts. Dark field search for *T. pallidum* is done on all lesions. A rather lengthy classification of the types of all lesions is made. Treatment is not discussed. Of the 25 illustrations 17 are colour plates, but unfortunately none are of the cervical lesions so much referred to and apart from which there is little to justify the appearance of this book.

The Rational Treatment of Varicose Veins and Varicocele. W.Turner Warwick, M.A., M.B., F.R.C.S., Surgeon to Out-patients and Surgeon in Charge of Rectal Department, Middlesex Hospital, etc. 188 pages, illustrated. Price 5/- net. Faber & Faber, Ltd., 24 Russell Square, London, W.C.1, 1931.

Mr. Warwick treats the subject of varicose veins in a methodical and scientific way. He discusses the etiology of varicose veins at length, dealing with the site of commencement of the varices, the theory of the musculo-aponeurotic obstruction, and valvular deficiency of the perforating and of the deep veins in relation to varicosis. He also recalls the normal venous return in the upper and lower limb, and stresses the importance of the valves in the perforating veins (a point which for some time has been very doubtful). He further discusses how the venous return depends upon the abdomino-thoracic pressure and suction, and muscular contraction and relaxation, including the vis-a-tergo.

The discussion of the anatomy of the venous system of the leg is clear and concise, and may better be studied here than in many other works. The various tests based upon the anatomy are tabulated and carefully explained, and may be used as an excellent guide. The technique is full and complete, covering that of injection and management of varicose ulcers. The author deals with the full and empty vein methods, and conditions under which one or the other is favourable. The method of handling cases with varicose ulcers gives excellent results, and is one which may be recommended for all to follow. The short discussion of hæmorrhoids and varicocele is concise and the conclusions may be relied upon.

Injuries and Sport. C. B. Heald, C.B.E., M.A., M.D., M.R.C.P., Physician with charge of Electro-Therapeutic Department, Royal Free Hospital, etc. 543 pages, illustrated. Price $7.50. London: Oxford University Press; Toronto: McAinsh & Co., 1931.

Books dealing solely with injuries received in sports are rare. The present volume is therefore likely to provoke a good deal of interest and may even stimulate the production of others. Its value will be specially appreciated by the general practitioner whom Dr. Heald has particularly in mind. The arrangement of the book is excellent. Each chapter is in two sections, one on diagnosis and one on treatment, but the first part of the book is devoted to general principles of repair and the various methods of examination. Dr. Heald reminds us that "the diagnosis of an injury is itself a 'game' in truest sense, in which the doctor must use all the weapons employed by the detective of fiction; sight, touch, hearing and even smell, as well as deductive and inductive reasoning".

The book is especially useful as indicating the value and the limitations of physiotherapy. The employment of electrical treatment is gone into with detail and great care is taken to explain the various currents, how they may be produced with simple apparatus, and when they should be used. In his short review of the subject of repair the author has undertaken a formidable task, as he fully realizes and admits. But he has produced an admirable statement of the essential feature points in the process. He makes the point that since, as far as we know, the repair cells are a primitive structure requiring for their development much the same conditions as are provided by the uterus, namely, warmth, stillness, salt water and oxygen, therefore the treatment of injuries should be designed towards producing these conditions for the damaged tissues.

The great variety and excellence of the numerous illustrations add an unusual interest to the book.

A Manual of Midwifery. Thomas Watts Eden, M.D., C.M., F.R.C.P., F.R.C.S., President, Royal Society of Medicine, Consulting Obstetric Physician to Charing Cross Hospital, etc., and Eardley Holland, M.D., B.S., F.R.C.P., F.R.C.S., Obstetric and Gynæcological Surgeon, London Hospital, etc. Seventh edition. 748 pages, illustrated. Price $6.25. Toronto: Macmillan Co. of Canada, 1931.

The seventh edition of this well-known work, with its many additions, will be greatly welcomed, especially in England. Every chapter has been more or less revised, and some of the recent discoveries added, as well as many new illustrations and plates. The author has again divided the book into nine parts:—normal pregnancy; abnormal pregnancy; normal labour; abnormal labour; the puerperium; the new-born child; injuries, diseases and death of the fetus; obstetric operations; and maternal mortality. One entirely new feature, which will doubtless be of great value to many readers is "The guide to further reading", found at the end of each chapter. It is not a complete bibliography on the subject, but five or six of the most outstanding articles are noted, many of which were consulted in revising the text.

In dealing with the physiology of the menstrual cycle, much of the recent work of Wilfrid Shaw,

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Corner, and others, has been embodied, including the rôle played by the pituitary gland.

Teacher's work on the ovum and the Ascheim-Zondek test are also added. Although there have been no major additions to sections 2, 3, or 4, much of it has been rewritten, particularly the management of labour in contracted pelvis. Dr. A. K. Tallerman, an expert pædiatrician, has dealt with the care and feeding of the new-born child. Modern methods of resuscitation are also included. The entire book is complete and yet concise.

Principles and Practice of Perimetry. Luther C. Peter, M.D., Sc.D., F.A.C.S., Professor of Ophthalmology in the Graduate School of the University of Pennsylvania, etc. Third edition, 315 pages, illustrated. Price $4.50. Philadelphia: Lea & Febiger, 1931.

The advancement made in perimetry in the last fifteen years is apparent from a comparison of this third edition with the first which was published in 1916. The book contains six chapters with an appendix, and is illustrated with 194 engravings and 5 coloured plates. Notable among the additions is a summary of the excellent work of Brouwer and Zeeman, who traced, by histological methods on apes, the distribution of the retinal fibres to their termination in the basal ganglia; and also of the work of Putnam who continued the distribution from the ganglia to the visual cortex. The author agrees with Troncoso in advocating strongly the anatomical method of recording fields. The improved technique and equipment of Ferree and Rand are described, and the quantitative and qualitative methods of perimetry are contrasted, and the advantages of each method are given. The valuable help given by visual field changes in the localization of intracranial lesions is elaborated.

The book is a necessity to all those practising ophthalmology, neurology, or neuro-surgery, and even the most adept in these subjects will profit by its perusal.

The Physical and Radiological Examination of the Lungs. James Crocket, M.D., D.P.H., F.R.C.P.E. Second edition, 296 pages, illustrated. Price 16/- net. London: H. K. Lewis & Co., 1931.

Books dealing with the examination of the lungs must needs take up more than routine physical methods. We are glad to note therefore that Dr. Crocket has included chapters on radiological methods, on bronchoscopy and on examination of the larynx. At the same time he has dealt faithfully with the ordinary clinical methods of examining the chest. One may question the necessity for dwelling in detail on some of the changes that may be noted in the general appearance of the patient, but this possible weakness is more than atoned for by the thoroughness insisted on in inspection, percussion and ausculation. The chapter on x-rays is sound and convincing. No one with any experience in diseases of the chest will doubt the absolute necessity of the x-ray as a routine proceeding.

The book will be found useful by anyone requiring a plain account of up to date methods in examination of the lungs.

A System of Bacteriology in Relation to Medicine. By various authors. Vol. 8. 390 pages, illustrated. Price £1 1s. 0d. Published by His Majesty's Stationery Office, London, 1931.

This volume opens with a chapter on fungi pathogenic to man. The ringworm group, as is proper, is given more detailed treatment than the parallel groups. Actinomycosis is next dealt with and after a short but interesting historical note sections are devoted to the anærobic and ærobic actinomyces, with a final division on actinobacillus. Chapters 4, 5, 6 and 7 are devoted to the spirochætes and syphilis, and as would be expected occupy the larger part of the book. It is worth emphasizing the fact that the spirochæte group is made up of microörganisms which are almost as ubiquitous as ordinary bacteria, but their study has not been taken up as steadily as in the case of the latter. Bacteriologists have been inclined to leave their study to protozoologists, but the latter have not been entirely ready to admit that they come into their domain. It is curious that there should have been such a gap in their study as existed between their first recognition by Leeuwenhoek in 1681 when he recorded their presence in the mouth and intestine, and the next description by Ehrenberg in 1834. It is only within the last 30 years that the group has received the attention which has resulted in the description of the large number now recognized.

A particularly interesting chapter is devoted to the normal bacterial flora of man.

Food Allergy. Albert H. Rowe, M.S., M.D., Lecturer in Medicine, in the University of California Medical School, etc. 442 pages, price $5.00. Lea & Febiger, Philadelphia, 1931.

This book provides a useful review of what is known regarding sensitiveness to various foods. Perhaps the term allergy has been stretched nowadays rather too much. It certainly has been made to do duty in a sense quite different from that in which it was intended by von Pirquet. The author of this book recognizes that so-called food sensitization is very frequently unaccompanied by the cutaneous sensitiveness which is so readily demonstrable in the sensitization caused by epidermals or pollens. The explanation of this has not yet been made clear, but if it is accepted that the sensitization is there, as Dr. Rowe believes, then his plan of dietary manipulation is well worth trial. The book gives a detailed account of the elimination methods of diet, and what is probably more useful in certain cases of ascertained sensitivity, of a number of recipes and recommendation to be followed in patients who have to live on wheat, egg, or milk-free diets.

The Conduct of Life Insurance Examinations. E. M. Brockbank, M.D., F.R.C.P., Honorary Consulting Physician, Royal Infirmary, Manchester. 172 pages. Price 7/6 net. H. K. Lewis & Co., London, 1931.

In his preface to this volume, which is one of "The General Practice Series", the author states that thirty years of experience in making insurance examinations has given him "Some definite ideas on things that matter most in making such examinations." During this period he has personally examined 10,000 applicants for insurance or for employment at home or abroad. It is evident that this work has been carefully and conscientiously done and personal conclusions have been correlated with the published reports of other observers and of insurance companies both in Great Britain and abroad.

The first section is devoted to the routine examination and its proper recording for "The guidance of those at head office." Here questions which must have troubled many generations of medical examiners are well discussed—personal and family history; hereditary diseases; personal habits, as well as past and recent illnesses being some of the items considered. Throughout this section, the author stresses the proper evaluation of slight variations from the normal and to many this will prove to be perhaps the most valuable part of the book. The significance of the usual signs and symptoms of organic change are briefly but well appraised.

The second section deals with the appraisal of "Impaired lives." At first sight it might seem that this phase of the question was a matter of concern only

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to the applicant and to the medical referee at head office, and yet if the applicant is to be fairly judged by the chief medical referee, the evidence for and against him must be carefully obtained and intelligently submitted. Medical examiners who are dealing with substandard risks will welcome this clear cut summary of current opinion in this much debated field.

In future editions it might be well to omit the suggestion on page 42 that it is not always necessary for the patient to strip to the waist for an examination of the chest. Probably in the author's work and with his experience such a method may be safe and satisfactory: in general, however, such advice is apt to lead to careless medical examinations.

The book is well printed, is written in an easy, almost colloquial style, and is an excellent presentation of a subject which should be of vital interest to almost every practitioner.

Carbon Monoxide Poisoning in Industry. M. R. Mayers, *Bureau of Ind. Hyg.*, State of New York.

This extensive monograph on carbon monoxide poisoning has recently been issued by the Bureau of Industrial Hygiene of the New York State Department of Labor. It consists of some 240 pages and contains an extensive bibliography and index. Chapters are devoted to the physiology, pathology, symptomatology and diagnosis of carbon monoxide poisoning. A whole section deals with the specific industrial importance of carbon monoxide and another section with the medical control of poisoning.

Dr. Mayers has had extensive experience with industrial toxicology and can speak with authority on the subject. The monograph is a useful work of reference and can serve as a companion to an earlier publication of the U. S. Public Health Service (Bulletin No. 150) on the same subject.

Fighting Disease with Drugs. A symposium edited by John C. Kantz, Jr., with an introduction by Dr. James H. Beal. 230 pages, illustrated. A publication of the National Conference of Pharmaceutical Research. Price $2.00. The Williams & Wilkins Co., Baltimore, 1931.

The purpose of this publication is to present the story of pharmacy as it is related to the preservation of health and the alleviation of human pain and suffering. Following a well-told history of pharmacy, there is presented, in a series of chapters, an interesting account of the nature of the drugs obtained from vegetable and mineral sources and what the writer calls bacteria-made drugs and vitamins. The manner in which man has duplicated many of the substances nature furnishes and how this is done, together with the standardization of drugs, the laws governing standards and narcotics are clearly set forth. A chapter entitled "The Corner Drug-store" is one which follows logically, as it explains how the various drugs are made readily available to all. The book is well written, and careful editing has prevented the overlapping and omissions which are not uncommon in symposia. It will be read with interest by those medical practitioners who enjoy seeing the practice of medicine and of an allied profession as viewed through eyes other than their own.

Selected Writings of John Hughlings Jackson. Volume 1. On Epilepsy and Epileptiform Convulsions. Edited by James Taylor, M.D., F.R.C.P., and others. 500 pages, 25/- net. Hodder & Stoughton, London, 1931.

Perusal of this splendid volume reminds one better than anything else could of what an amazing man Hughlings Jackson was. In the brilliant galaxy of British physicians his star shines with undimmed radiance. As Sir James Taylor points out, he was not only a remarkable neurologist, he was a neurologist who never ceased to be a physician. Many of his clinical observations in the field of general medicine, such for instance as those on the significance of heart murmurs, were almost heretical no doubt at the time they were made, but time and experience have abundantly confirmed his interpretations. A clinician of the very best type, he certainly was—curious, keen, alert, observant. But he was also a philosopher. In fact, had it not been for the urgings of his friend, Jonathan Hutchinson, he probably would have devoted his life to philosophy. Hutchinson wondered later if he had not made a mistake in thus influencing him. Neurologists the world over have no such questionings in their minds. They will be deeply grateful to the sponsors and editors of this book. Here are gathered together in an admirable way the outstanding writings on epilepsy and allied conditions. The task of selection must have been a heavy one, for Jackson was a prolific writer. Over a period of forty years he contributed many articles to practically all of the regular British medical publications. During his lifetime he was urged by many, among them Osler an Weir Mitchell, to gather these together. He promised to do this, but never accomplished it.

It would be useless to attempt to analyze and set forth the contents of the book. Suffice it to say that here one finds hosts of the most careful clinical observations, correlations of symptomatology and pathology, and brilliant philosophizing on the many problems inherent in the study of epilepsy. The author seems to have been thoroughly conversant with what must have been the entire output of literature bearing on epilepsy. His pupils, one of the most outstanding of whom is the editor of the present volume, were most closely associated with him in his investigations, and one is impressed by the status that these men have since attained. No better evidence is needed that the man and his work were the source of wonderful inspiration. It is true that a certain amount of repetition occurs in the book; such is to be expected in a volume of "Selected Writings." But since the same idea enunciated in different places is often arrived at by different routes, one could not say that the repetition was in any way irksome. Treatment is not discussed extensively.

One finds here the original observations and writings on the subjects with which Jackson's name is so intimately associated in the minds of all physicians—localized epilepsies, epilepsies preceded by olfactory auræ, and epilepsies with the intellectual aura often referred to as "depersonalization."

The book is a veritable mine of observations and astute interpretations. Once more one may say that neurologists the world over will be grateful for it, not only because of its value as a treatise but, equally, because it is a memorial to a mighty mind.

The Lane Lectures on Pharmacology. Prof. Walther Straub. Stanford University Publications. Medical Sciences Vol. 3, No. 1. Stanford University Press, Stanford University, California, 1931.

While these lectures were delivered in April, 1929, it is only now—more than two years later—that they become available to the reader. In only one of his talks did Professor Straub speak to any considerable extent from personal experience with the subject. In the others he spoke as a professor of pharmacology—with interest and thoughtfully, but not on the basis of extensive work in the fields in question. As a whole, therefore, the lectures will satisfy some and dissatisfy others. The physician who desires a general viewpoint on the subjects covered can read them with interest. Anyone who prefers the more detailed consideration of narrower fields will be somewhat disappointed.

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The first lecture is a popular account of the intoxicating actions of alcohol, morphine, cocaine, hashish and the atropine group. The few pages on alcohol, especially, give an interesting account of the most outstanding features of the action of this important substance. In his second lecture, Professor Straub attempted to cover general anæsthesia from nitrous oxide to avertin. The task was too great and consequently each substance is treated far too briefly to satisfy. The chief substances discussed are nitrous oxide, ether, the barbituric acid derivatives and avertin.

The third lecture deals for the most part with chemistry. Much important work has been done in recent years to elucidate the very complex nature of the active constituents of digitalis. Eventually, such work will have its applications, but Professor Straub admits freely that to-day, so far as the therapeutic use of digitalis and substances with similar action is concerned, the tincture and the leaves in general are still of most importance. This chapter would be of interest only to the physician with a chemical bent. The lecture on the biochemistry of digitalis is the best of the series. Why Professor Straub headed the lecture in this way is not clear; there is no more chemistry in the account than there is in the average pharmacological paper. In this chapter the lecturer was in his chosen field and much of the material given has issued from his own laboratory. Among other phases of the subject, this chapter includes the discussion of the differences between the actions of the various active constituents of the digitalis group, of the amounts involved in producing cardiac effects, of the distribution of the substances in various parts of the body, of the time and concentration factors in producing an effect and of the time required for the fixation of the glucosides by the heart, together with the latent period elapsing before the action is manifest. Suffice it here to note that only from 4 to 7 per cent of the digitalis administered is fixed by the heart and that the fixation time is much shorter than the latent period of cardiac action.

Camphor has fallen so low in the estimation of many pharmacologists and physicians that it seems strange that the greater part of a lecture should have been given to this substance. Even Professor Straub can find little to support the extensive use it has had in the past. However, in recent years, camphor has stimulated pharmacologists to improve upon camphor. Brief comment upon two substances now in use, hexetone and cardiazole, bring the lectures to a close.

BOOKS RECEIVED

General Surgery. Edited by Evarts A. Graham, A.B., M.D., Professor of Surgery, Washington University School of Medicine, etc. Practical Medicine Series. 848 pages, illustrated. Price $3.00. Year Book Publishers, Chicago, 1930.

Handbook of Diseases of Children. Bruce Williamson, M.D., M.R.C.P., Physician to the Royal Northern Hospital, London, etc. 290 pages, 50 illustrations. Price $3.00. Edinburgh: E. & S. Livingstone; Toronto: Macmillan Co. of Canada, 1931.

International Clinics. By various authors. Volume 2, forty-first series. 306 pages. Philadelphia, London and Montreal, J. B. Lippincott Co., 1931.

Spa Treatment. Compiled by the Harrogate Medical Society.

Surgical Clinics of North America. By various authors. Issued serially, every other month. Volume 2, No. 3. New York number. 300 pages, illustrated. Price $18.00 (6 numbers). London and Philadelphia: W. B. Saunders; Toronto: McAinsh & Co., 1931.

Collected Papers of the Mayo Clinic and the Mayo Foundation. By various authors. Vol. 22. 1125 pages, illustrated. Price $13.00. London and Philadelphia: W. B. Saunders; Toronto: McAinsh & Co., 1931.

"Respice—Prospice": Lewis's 1844-1931. An illustrated account of its Foundation and Development. 32 pages, illustrated. London, H. K. Lewis & Co., 1931.

Chinin in der Allgemeinpraxis. Dr. Med. Fritz Johannessohn, Mannheim. 232 pages. Published by Bureau tot Bevordering Van Het Kinine-Gebruik, Amsterdam-W, 1930.

Medicine. Part III. Diseases of Alimentary Tract. Third edition. Catechism Series. Price 1/6 net. Edinburgh, E. & S. Livingstone, 1931.

LEAD POISONING FROM TOYS.—The Director of the United States Public Health Service has been informed by leading pædiatricians of the occurrence of a number of cases of lead poisoning in infants and children, apparently due to biting lead paint from cribs, toys, etc. The Public Health Service has previously called attention to this possible source of lead poisoning but it is likely that more cases occur than become known. Though lead paint has wide fields of usefulness, the painting of babies' toys and cribs is not one of them. It is presumed the manufacturers of these articles will see to it that lead paint is not used for this purpose, but warning is necessary that parents, especially in repainting cribs, should use paints which are free from lead. Although in recent years it has been found that the human body takes up lead from its surroundings much more frequently than was formerly supposed, and although there are still important industrial sources of lead poisoning which need correction, the incidence of lead poisoning does not seem to be on the increase. One of the most prolific sources yet remaining is the painter's trade, and it is believed that here the dust arising from scraping or sandpapering dry paint may be more important than the actual painting.—*J. State Med.*, 1931, **39:** 302.

THE RELATION OF HUTCHINSON TEETH AND PFLÜGER'S BUD MOLARS TO CONGENITAL SYPHILIS.—Gerhard Kreyenberg and W. Schwisow examined 50 patients with congenital syphilis from the Hamburg Institute for feeble-minded children. In both these forms of anomalous teeth the typical change is underdevelopment, rather than change in the structure of the enamel. The change in the first incisors called Hutchinson teeth is very familiar. In Pflüger's teeth the first molars are somewhat the shape of an unopened bud, giving the anomaly its name. The largest diameter of the tooth is in the neck, and the cusps are folded over as if the tooth had not reached complete development. A cross-section of the molar is circular instead of quadrangular as it is in the normal tooth. In 50 per cent of the cases examined by the authors there were typical Hutchinson teeth, and in 52 per cent bud molars. In 20 per cent of the cases there were neither Hutchinson teeth nor bud molars. Both Hutchinson teeth and bud molars are found almost exclusively in congenital syphilis. In about 1 to 3 per cent of cases these forms of teeth are found in patients who do not show manifest clinical signs of syphilis, but there is generally a history indicating syphilis.—*Ztschr. f. d. ges. Neurol. u. Psych.*, 1930, **127:** 188.